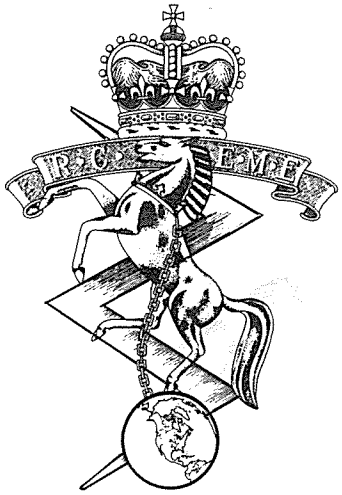
A. L. MacLaw

# RCEME TECHNICAL BULLETIN




*Features*

WHO'S WHERE IN WHAT CFB

FROM CLERK TO CONTROL OFFICER - WHY NOT?

IS OUR INSTRUMENT REPAIR EQUIPMENT SUITABLE?

RCEME REPRESENTS CANADA ON NATO PARADE

BASE MAINTENANCE UNIT No 1 (AAMU), CFB RIVERS

VOLUME II, NUMBER 3. JULY 1966

# RCEME TECHNICAL BULLETIN

Volume 11, No 3, July 1966

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This Technical Bulletin is issued under the authority of Colonel KR Ward, CD, SSO Maint, LMM MATCOM. The contents have been approved for publication by Lieut Colonel JP Sherren, CD.

The Bulletin is published to assist RCEME personnel in keeping abreast of current trends in developments, to amplify or emphasize technical instructions, to circulate news of Corps and individual activities, and to provide a forum for discussion and the exchange of ideas by members of the Corps. The information and statements herein do not necessarily represent official policy and are not to be quoted as authority for action.

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Our panel of Associate Editors has been radically revised. Inasmuch as the old command structure, with its Command EMEs, has disappeared, it was necessary to make some changes anyway.

These officers, with the Commandants of the School, 202 and 204, have for years been our Associate Editors. By and large they have, with a few exceptions, passed on what news there was and thus assisted us in our preparation of the Bulletin.

Now with the general broadening of the work of our Corps, it is only proper that we enlarge our 'board' of associates. You will note that in the 12 appointments shown above, we have tried to provide a cross-section of RCEME activities in the new integrated Canadian Forces.

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We are happy to add our "Well Done" to the tribute paid Cfn MP Sharman in "Spanner Speaks" (page 28). Cfn Sharman is a driver with the Recovery Platoon of 4 Field Workshop. He has "...recently completed his 20,000th accident-free mile... much of this mileage was driven in a 5-ton M62 Wrecker, often with another vehicle on suspended tow..."

Why is there no official recognition for feats like this - many decorations have been handed out for less!

---

THIS SUBJECT IS OPEN FOR DISCUSSION

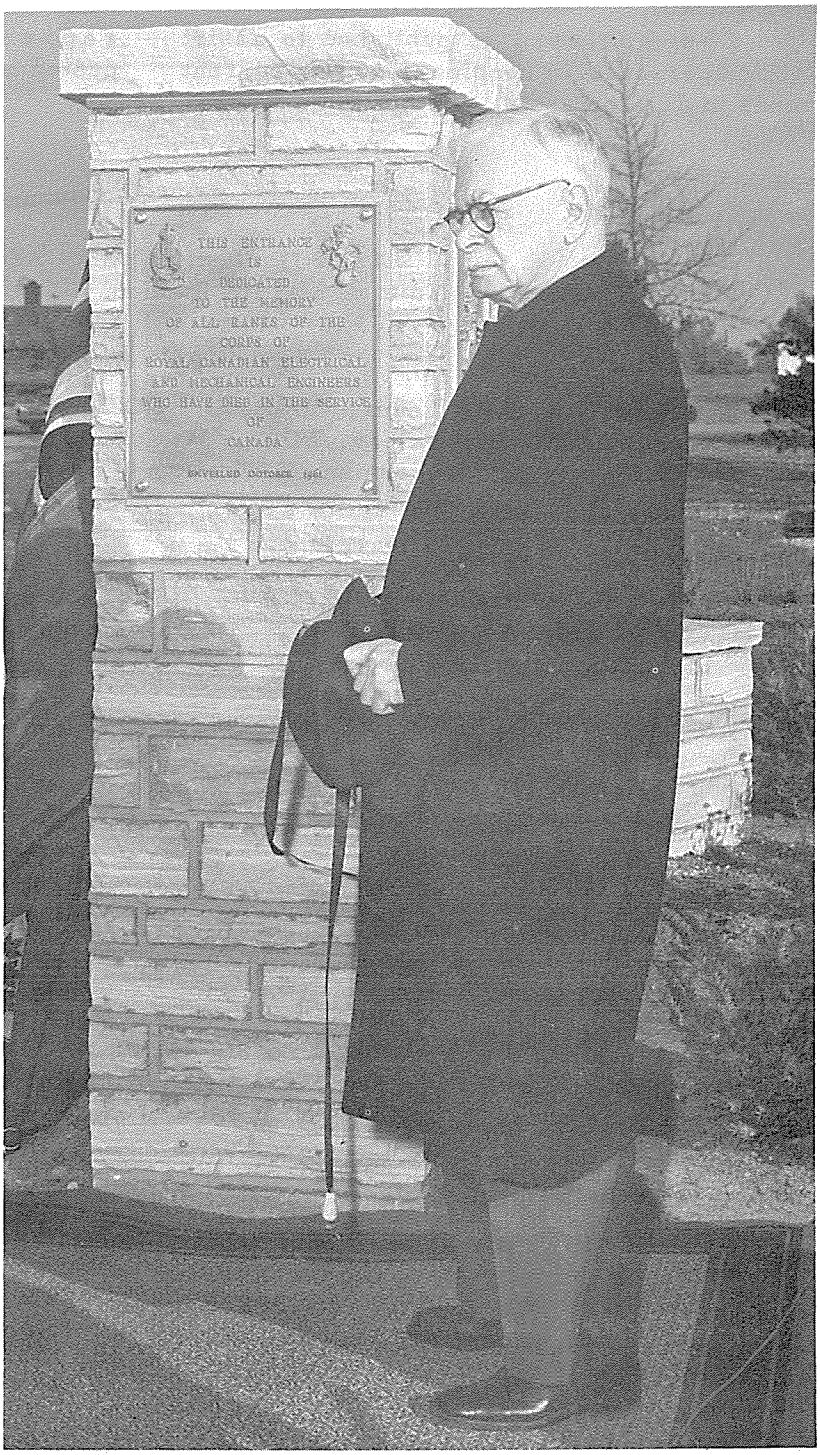
"How Much Repair Within the Brigade?" (page 30 ) is the kind of article usually referred to as "timely". There are those who would say rather, "high time!" If you think this observation implies criticism, please note that it is in PTO section of LMM that such ideas should be generated. Thank you for the prod, Major Girdler. We hope your article stimulates others to overcome their reluctance or lethargy, and produces a blizzard of opinions on this subject.

The Corps of RCEME has lost a good friend - General The Honourable AGL McNaughton, PC, CH, CB, CMG, DSO, CD died 11 Jul 66 at his summer home in Montebello, Que.

The General was directly associated with the Corps for 18 years, 12 Mar 46 to 18 Mar 64. First as Honorary Colonel; then Honorary Colonel Commandant; and last, Colonel Commandant. The title changed but the general continued, faithful to the Corps, in a very active capacity. (See the Technical Bulletin for April 1964, for short biography.)

He had been at least partly responsible for collecting the mechanical and most of the electrical engineering of the army into one while GOC-in-C, First Canadian Army during the Second World War.

After his retirement in March 1964, he was 'dined out' by RCEME officers from Quebec and Central Commands in the Officers' Mess at the RCEME School. On this occasion General McNaughton presented a silver rose bowl to the Corps commemorating his close association during "... the first two decades of the Corps."




After Unveiling the Memorial Gate at the RCEME School
October 1961

## BIRTHDAY CELEBRATIONS AT THE RCEME SCHOOL

By Lieut WD Armstrong

On Friday May the 13th, the RCEME School celebrated the 22nd birthday of the Corps.

Activities began in the morning with a parade for Air Vice-Marshall FR Sharp, DFC, CD, Commander of Training Command. Due to inclement weather it was necessary to hold the parade in the drill hall at the school. However five companies were squeezed into the hall and under the command of Colonel AL Maclean, CD, Commandant of the RCEME School, the officers and men presented an excellent turn out.

In his address to the parade, Air Vice-Marshall Sharp complimented the men on their fine turn out. He emphasized the need for more and more technically trained personnel in the services as integration had brought with it highly complicated pieces of equipment. Therefore the future for personnel of the Corps of RCEME looks bright.

In the afternoon the Air Vice-Marshal toured the three trade companies at the School with the aim of seeing as many students at work as possible.

Friday night was a time for parties at the School and there was no lack of these. Formal balls were held at the Officer's Mess, the Sergeants' Mess and the Junior Ranks Club. A stag party was held in the drill hall for those students who were without dates. All parties went to the wee hours of the morning with the highlight being the cutting of a birthday cake at each party.

On Sunday afternoon a Drumhead Service was held on the parade square. The service was officiated by Major Gagnon and Major Howson, the padres of the RCEME School.

The service was attended by many of the dependents of personnel at the School. On parade were the same five companies that were inspected on the thirteenth.

After the service the five companies, led by the RCEME School Band, had a march past with Colonel Maclean taking the salute.

(continued on page 5 )

AIR VICE-MARSHAL SHARP INSPECTS THE PARADE, accompanied by Capt Argue, RCR, Platoon commander, and Col Maclean.

THE RCEME SCHOOL BAND LEADS THE WAY. The drum major is Cpl WCM Baird.

COLONEL MACLEAN TAKES THE SALUTE. The march past is headed by Maj RF Fendick, Lt JJ Fyfe and WO 2 RF Hennessy.

## RCEME BIRTHDAY - WESTERN STYLE

RCEME in Calgary celebrated the Corps Birthday with a sports day followed by a dinner dance. The weatherman co-operated and sunny Alberta lived up to its name by providing us with a fine spring day. The day was topped off with a ball game - field vs static. The score can't be reported, but it was such a good game that at one point we had to pull the umpire.

In the evening a dinner dance was held at the Lone Pine Supper Club. The steaks (Western beef, of course) were excellent. After dinner the CO of 1 Field Workshop gave a short address and the CO of 215 Workshop wielded his sword to cut the birthday cake.

As the evening progressed even some of our more conservative types were seen trying out the frug and some of the other 'modern' dances. It was an excellent 'do'.

PLAY BALL! Ssgt Linmier, Cpl Lama and Major Nicholson

(RCEME SCHOOL BIRTHDAY CELEBRATION continued)

To finish off the day a tea was held in the Officers' and Sergeants' Messes and an open house in the Junior Ranks Club.

With these activities over, the School had completed its celebration of the 22nd birthday of the Corps. Happy Birthday RCEME.

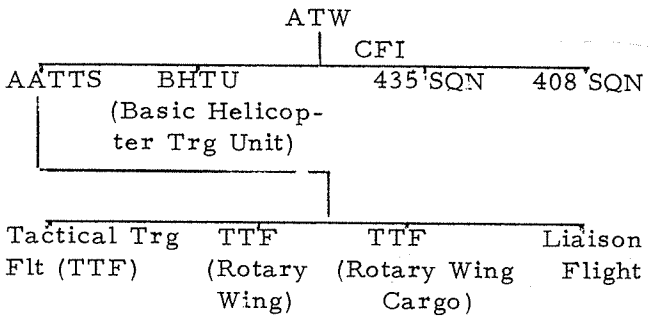
MAJOR HOWSON CONDUCTS THE DRUMHEAD SERVICE

# BMU 1 (AAMU) CFB Rivers

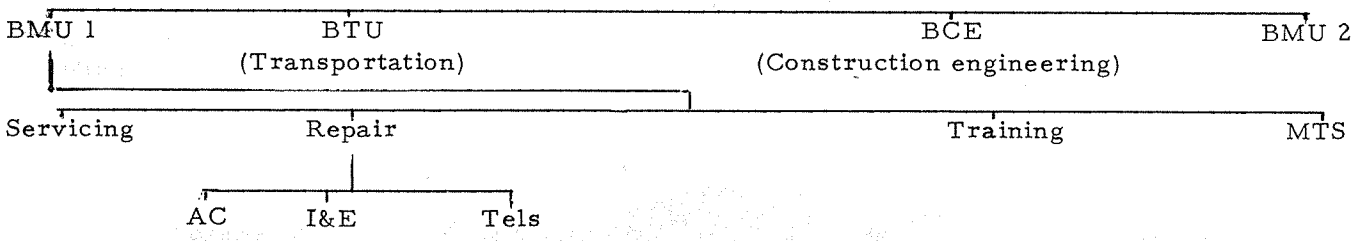
(The following story of BMU 1 is a joint effort, comprising an introduction and a short summary of each of the sections that go to make up the Unit. Each write-up was prepared by the individual responsible for the section at the time).

The basic purpose of army aviation at CFB Rivers is to teach pilot training. The aircraft employed to meet this demand are repaired and serviced by personnel of BMU 1. Since a fairly large amount of repairs go on here it seemed logical to expose tradesmen to the system so that they too may become aircraft technicians. Hence a by-product of pilot training is technician training.

At first glance it appears most economical and sound to train both pilots and technicians on the same aircraft. Unfortunately it becomes tantamount to running a workshop with group 1 tradesmen. Each has come to appreciate the situation and accept the inherent shortcomings. A line diagram of the Air Training Wing (ATW) is shown below.




BMU 1 service all aircraft operating within AATTS and BHTU and do field repairs to the aircraft operating on the AOP Troop CFB Shilo. The maintenance organization to meet this demand can be line diagramed as follows:




## ARMY AIRCRAFT MAINTENANCE

by

Capt JH Cooper, RCEME

Helicopters and low performance aircraft are not only used to support a modern army, they are part of it: as much a part as a jeep or field gun. The aircraft has taken its place in the Canadian Army in units of the Armoured Corps, the Artillery, the Army Service Corps and in the formation Headquarters. These units and headquarters are deployed in different locations in the field force and may be separated by from 15 to 50 miles. Their roles are different. Some may be in contact with the enemy, others may be far to the rear in supply duties. All of them have aircraft which must be maintained but because of their deployment the method of maintenance must differ.

The maintenance of aircraft, particularly a sophisticated helicopter, requires a smooth-running organization of highly skilled tradesmen, good tools and test equipment, the best accommodation, ample time and no interference. At least these are considered to be normal requirements for an efficient aircraft maintenance organization.

Not all of these optimum conditions can be met when an army takes to the field. Not only must the aircraft operate and be maintained in isolation from the normal industrial support but those who fly and fix it must do so within the usual wartime ground environment. In order to survive on the modern battlefield, the

Cfn Crosby reassembles an auxiliary power unit, used to start the main turbine engines of a CH113A Voyageur helicopter.

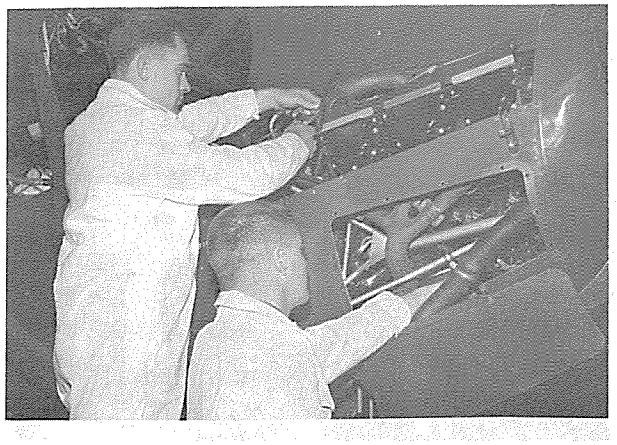
Army must move dispersed from cover to cover, usually at night, to avoid detection. It must hide, dig in and fight, concentrate quickly, counterattack and disperse rapidly again to avoid presenting a nuclear target. Mobility, flexibility, concentration of force and offensive action are routine actions for a ground force. Indeed these functions are principles of war that cannot be ignored, and maintenance must be organized and the personnel conditioned to do the job consistent with these principles.

The system of maintenance used in the Canadian Army is based on two lines of support, "Unit Repair" and "Field Repair". Unit repair is performed by Royal Canadian Electrical and Mechanical Engineer tradesmen under command of the operating unit. It consists of servicing, tests and adjustments, replacement of minor components and performance of primary and supplementary inspection. This allows the unit a wide degree of flexibility of employment and location.

The second line of support - Field Repair - is carried out by the aircraft repair platoon of the Field Workshop, RCEME. This consists of all types of maintenance and repair normally performed by RCAF base maintenance. It includes exchange of major components, repair of minor assemblies, patch 'skin' repairs, modifications and periodic inspections. The aircraft are usually flown or brought in for repair but mobile repair teams can be sent out to complete the repair on site. The aircraft platoon is under command of an aircraft maintenance officer and is normally located with the field workshop. This platoon usually forms the Brigade Air Strip.

An exception to this arrangement is found in the Transport Helicopter Platoon (RCASC), which has both the unit and field repair elements under its command. This organization is used because the Transport Platoon will likely be deployed further to the rear of the formation than will the aircraft repair platoon of the field workshop.

All aircraft repair elements are equipped with shop vans, tools and equipment to the scale required to carry out their role. They are completely mobile and are organized in a way that permits maintenance support either at the main base location or at the aircraft unit site. The tradesmen are trained as soldiers as well as technicians, since they must operate in close proximity to the enemy lines. Any relaxation of the principles of concealment or movement could render them casualties, nullify their maintenance effort, or even compromise the operation.



Cfn Royal and Cfn Cabana carry out a primary inspection on the engine of an L19 Cessna aircraft.

Aircraft spare parts are carried at each level of maintenance support consistent with the general requirement and based upon the permissive repair schedules. In addition the Ordnance Field Park hold, in vehicles ready for movement, a back-up stock of spare parts sufficient for 60 days of operation.

It is evident that, in the field, army aircraft are maintained by technicians who must soldier to survive. They are organized into functional units either in support of, or under

command of, the operational unit, depending on the functional role or location of the fighting unit. These repair elements have the same mobility as the fighting unit they support and are able to move with these units into the battlefield.

## A BRIEF LOOK AT THE SERVICING SECTION

by

Sgt MJ Juneau

This section is composed of approximately 20 technicians including 4 NCOs. It is divided into two shifts: Early from 0630 - 1400
Late from 1400 - 2000 (about)

"Easy does it", Sgt Dowdell directs the lowering of a transmission on a CH112 Nomad helicopter, as Lcpl Djuff and his crew carefully guide the mating surfaces together.

Servicing is an appropriate name to describe the activities of this section, whose purpose is to provide the operators with the aircraft required to accomplish their mission; be it training, continuation flying or emergency calls. Cessna L19s, RECCE CH112 Hel and Cargo CH113A Hel are all included in our line up. The tasks assigned to the servicing section are as follows:

To liaise with production for number and type of aircraft serviceable, repairs and inspections.

To correct minor defects whenever possible.

To carry out daily inspections, supplementary checks, special inspections, between-flight inspections and fuel, as necessary with 80-87 or JP4.

To refuel, marshall, assist in starting the aircraft with portable gas-driven generators, assist the pilots in case of malfunctions of the aircraft systems.

To tow the aircraft in and out of the hangars.

To liaise with the allied trades for repairs and inspections.

To liaise with the Pilot's Training Sections for the number and type of aircraft needed for day or night flying and other requirements.

During the last winter the flying schedule was kept up even when the temperature dropped to -30°F with winds of 25-30 mph (you wonder why we had so many red-cheeked pilots and technicians last winter?).

On account of its functions, servicing at times turns into a flurry of activities. I almost said frenzy!

To the uninitiated, walking into servicing on a busy day is quite an experience: Aircraft coming and going, pilots waiting, fuel bowser with the nozzle at the ready (almost all aircraft have to be inspected and refuelled after each flight), technicians busy inspecting, refuelling, checking and towing until all the aircraft are airborne.

If the same person was to take another look at the servicing section after all the noise and rush have died down, he would get the mistaken impression that being on servicing is the peace time equivalent of R and R.

Cfn Bretsch spec-tests an ARC 44 radio used for air-to-ground communication in Army aircraft.

But beware! The aircraft have now been gone for almost one hour and those black spots out there at the end of the runway sure look like a bunch of L19s coming in!

Onward Servicing, here we go again!

Check, marshall, refuel, etc, etc.

I almost forgot, servicing is also responsible for having some helicopters and equipment ready in case of emergency.

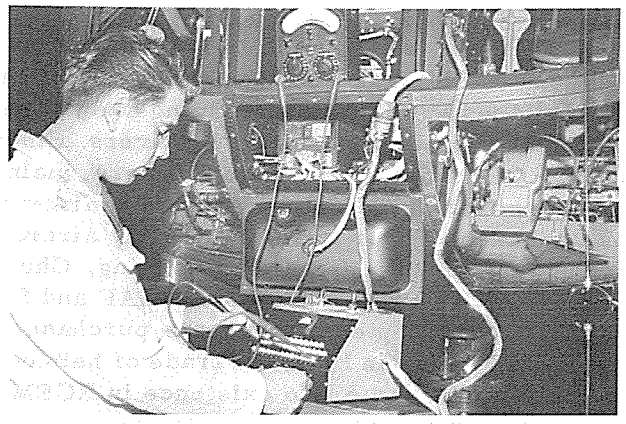
Dreaded by some and liked by others, time spent in the servicing section is a valuable experience for junior craftsmen and oldtimers alike.

A kind of proving ground for personnel, it's an almost sure bet that if a cfn has "made the grade" in servicing he'll do all right on the production side.

Oh, oh, here's that phone again...

What, Sir? Three more Hillers out? But that's all we have serviceable! All the others are being repaired/.....you still want three more.....All right, Sir, we'll see what we can do.

Production - Help!



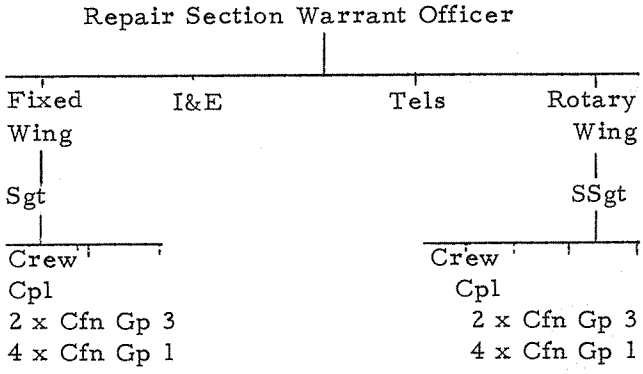
Cfn Pritchard calibrates the SAS (stability augmentation system) in the nose of a CH113A Voyageur helicopter.

## AIRCRAFT REPAIR SECTION

by

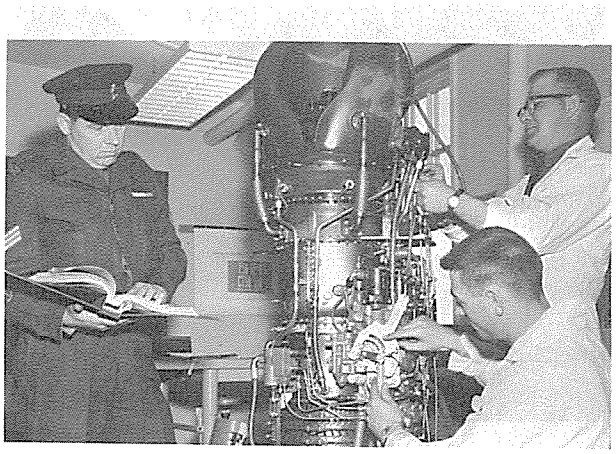
Capt WRL Springford RCEME

One of the primary functions of the Army Aviation Maintenance Unit at CFB Rivers is to keep the aircraft flying. The main section devoted to this effort is the Repair Section where scheduled inspections and unscheduled repairs are carried out. The normal breakdown of the personnel in this Platoon is as follows:




Despite the neat breakdown into crews, because of the requirement for immediate repairs, all crews must be able to immediately swing from fixed wing repair to rotary wing repair or vice versa.

Most of the work done on the production floor is the rectification of major unserviceabilities. These are faults that will prevent an aircraft from flying. Because of the high percentage of aircraft committed it is always necessary to start repairs as soon as the unserviceability is detected, to permit the operators to carry on with their scheduled program. It is rarely possible to schedule anything except inspections or minor repairs or modifications more than a few hours in advance. Most minor repairs are completed by the Servicing Platoon in the evening or on bad weather days,



Ssgt Atkin checks the book as Lcpl Boulton and Cfn Nicholson adjust the fuel control after reassembling a T58 turbine engine.

when the aircraft are not flying.

The corporals or lance corporals in charge of crews are given the responsibility of the repair job at hand under the supervision of their section supervisor. In addition to repair, however, they must also spend considerable time and effort training the group 1 tradesmen assigned to their crew.

The on-job training facet is a very important one since it would be unfair to burden a working field unit with the additional task of upgrading trainees. This explains the large proportion of group 1s in each crew. These are all the young upcoming tradesmen in the aircraft field. With the large number of trainees moving through the unit it has become necessary to assign a Senior NCO to the task of controlling the rotation of trainees through sections to ensure that a well-rounded and capable tradesman is produced.

The Senior NCOs in charge of the repair sections have a responsibility for more than simply managing the crews under their control. They must ensure that a high level of quality is maintained by on-the-job inspections; they must supervise techniques and troubleshooting methods; and be available to advise crews whenever necessary.

The tradesmen on the production floor are the end result of the training in the aircraft field--they are the ones who carry out the primary function of keeping the aircraft flying.

Cfn Tweddle inspects the forward flight control linkage of a CH113A Voyageur helicopter, in for a periodic inspection.

First Master Aircraft Technician Gp 4A Course conducted at Rivers. Back Row (l to r): Cpl MD Quinn, Sgt HJ Atkinson, Cpl GF Hayes, Cpl RE Mitchell. Front Row: Ssgt PA Hudson (Instructor) Sgt JH Brooks, Lsgt JV Leblanc, Sgt GPL Poole

## TRAINING OF AIRCRAFT TECHNICIANS

by
Capt PP Pospisil RCEME

The technicians who keep the Army's fleet or airplanes and helicopters flying are trained in their specialist skills at CFB, Rivers. Since 1956, RCEME has been training officers, maintenance supervisors and technicians on aircraft maintenance. Prior to 1960, the only aircraft in the system were Cessna fixed wing, Chipmunk trainers on loan from the RCAF and Sikorsky H5 helicopters. With the purchase of the CH112 Hiller in 1961, the trade of helicopter technician came into existence in RCEME and necessary technicians were trained at Rivers. In addition, radio, instrument, electrical, sheet metal, clerical and stores personnel were trained in skills peculiar to aviation. The 'recce' helicopters were dispatched to NWE in May 1962 with a full complement of qualified maintenance personnel.

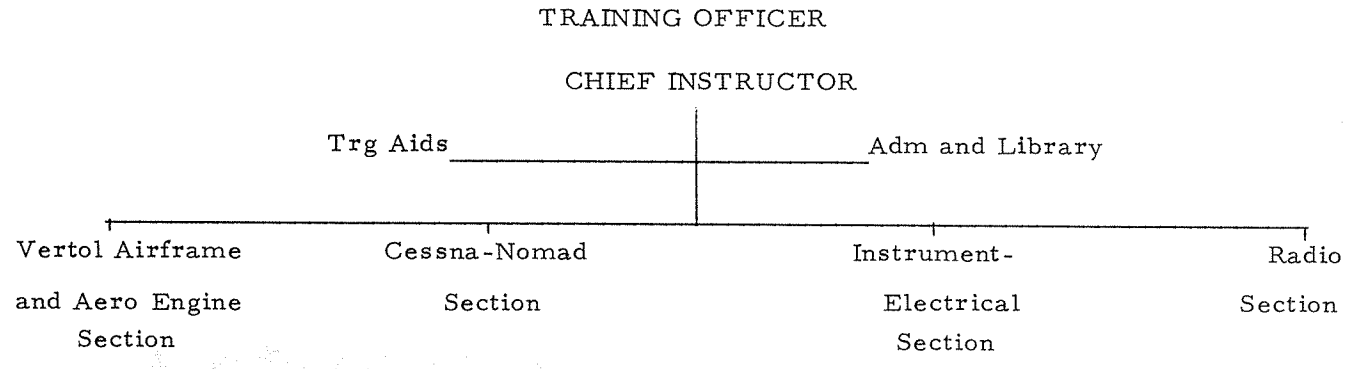
Late 1964 brought the Vertol CH113A cargo helicopters to the Canadian Army. Selected RCEME helicopter technicians were sent to the

(One of the 'originals' informs us that the first army aircraft technicians were trained at Sea Island, BC, Rockcliffe and Trenton, Ont, Greenwood, NS, and Rivers, from 1957. —Editor)

USA on short factory courses conducted by Boeing-Vertol and General Electric. This cadre of technicians returned to Rivers to gain proficiency on the complex new helicopter and started training the large numbers of additional technicians needed to support this added flying role. Six months after the first CH113A arrived in Rivers, the newly formed First Transport Helicopter Platoon was operationally employed in Camp Gagetown on summer concentration accompanied by a fully trained first and second line maintenance crew. At the same time, a large maintenance staff was still required at Rivers to support the pilot training program.

TRAINING ORGANIZATION

Although no formal training school for aircraft technicians exists at Rivers, the Army Aircraft Maintenance Unit conducted 46 courses, graduating 293 technicians, supervisors and pilots during 1965. Because of the heavy training load, the need for a training organization was recognized and a Training Platoon was formed. NCOs were taken from the repair and servicing sections of the aircraft workshop to carry on the time-consuming task of technician training. Course syllabi and timetables had to be drawn up, lesson plans prepared, training precis and manuals written, and hundreds of slides, charts and training aids manufactured to enable courses to be conducted. Training was broken down into trade sections as shown:

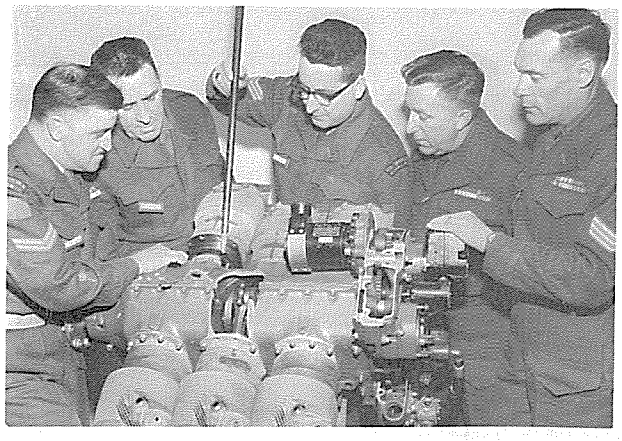



Since no establishment exists for training, the instructor staff varied from six to fifteen instructors, depending on the course load and the number of NCOs that could be spared from the maintenance task.

AIRCRAFT TRADES

Training is conducted for the following RCEME trades:

a. Master Aircraft Technician
b. Aircraft Technician (Cessna-Nomad)
c. Aircraft Technician (Voyageur)
d. Master Aircraft Instrument-Electrical Technician
e. Aircraft Instrument-Electrical Technician (Cessna-Nomad)
f. Aircraft Instrument-Electrical Technician (Voyageur)
g. Metals Technician (Air)
h. Radio Technician (Avionics)



The Continental 0-470-11 horizontally-opposed engine is the "rubber band" that turns the prop on the Cessna L19. 'Pulling a jug', Sgt Benoit teaches correct inspection method to Gp 3 course. (l to r). Cpl EE Stevens (4 RCHA AOP Tp), Cfn RH Harvey (AAMW), Sgt Benoit, Cfn AN Seelye (1 RCHA AOP Tp), Sgt RA Craig (AAMW)

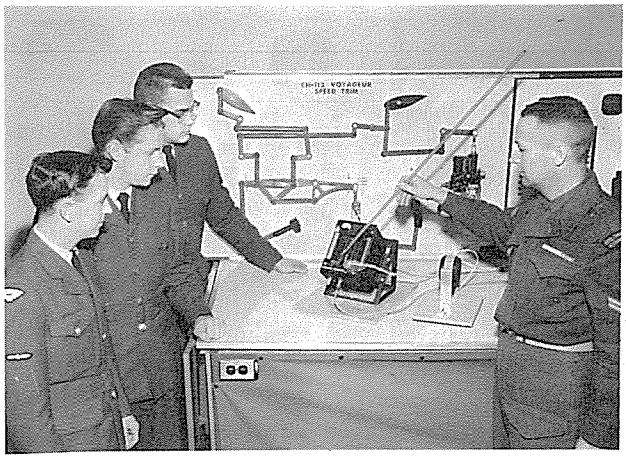
Courses conducted include proficiency courses on aircraft type, conversion courses for partially-trained technicians, Gp 3 qualifying courses, radio, instrument and electrical courses as well as courses for RCAF technicians and Technical ground school instruction for student pilots.

## GROUP 1 TRAINING AT BORDEN

Initially, tradesmen for the aircraft trades were taken from RCEME ground trades and retrained in aircraft maintenance. In 1964, the RCAF at Camp Borden started conducting Group 1 Aircraft Technician and Aircraft Instrument-Electrical Technician courses for new soldiers. About 75 of these Group 1 tradesmen are now at Rivers undergoing on-job training in their aircraft trades.

## TRAINING OF RCAF TECHNICIANS

The RCAF purchased the Vertol CH113 Labrador as a search and rescue helicopter. Since this helicopter was similiar to the Army's CH113A Voyageur, the Army at Rivers was given the responsibility for training RCAF helicopter technicians. The first series of courses for aero engine, air frame, instrument and electrical technicians and pilots, maintenance supervisors and flight technicians were run in the fall of 1965.



Integration at its best! Cpl GF Haney instructing RCAF Instrument technicians on the complexities of the Vertol speed trim system using the SAS trainer. (l to r) LAC JY Mercier (Stn Comox), LAC JC Moreau (Stn Trenton), LAC DW McLeod (Stn Trenton), Cpl Haney (Ac IE instructor AAMW).

## CYCLE OF TRAINING

Aircraft technicians and instrument electrical technicians follow the same training cycle as other RCEME trades, namely, Gp 1 by course; Gp 2 by on-job training followed by trades test; and Gp 3 by course. Supervisor qualification is obtained by passing the Pre-Gp 4 assessment and successful completion of a Master Technician course.

Radio and metals technicians and clerks specialize in aircraft as an additional requirement to their basic trade.

## FUTURE TRENDS

Over the period of a few years, RCEME has trained maintenance personnel to support aircraft in various locations; the brigade in NWE, flights in Gagetown, Petawawa, Ottawa and Shilo, and the Helicopter Platoon and the Army Aircraft Maintenance Unit in Rivers.

The Army will likely buy other aircraft in the future and highly skilled tradesmen will be needed to carry on the job of keeping them flying. Training new tradesmen will be a continuing task to ensure that adequate numbers of maintenance personnel are available to support the Army's operational needs.

Cfn MacLean carries out a leak test on the pitot static system of a Cessna aircraft.

## INSTRUMENT AND ELECTRICAL SECTION

by

S/Sgt KM Sturley

The Army Aircraft Instrument Electrical Technician trade, although just recently recognized as a new trade in RCEME, had its inception in the late fall of 1956, when a few instrument and electrical technicians were posted to the US Army Transportation School in Fort Eustis, Virginia, to begin courses on light aircraft. From here, the early pioneers of the trade were posted to various RCAF and RCN stations across Canada to take concentrated training on aircraft instrument and electrical systems, under supervision of RCAF and RCN technicians. These trainees in the aircraft 'racket' wrote RCAF and RCN trade examinations with excellent results and all were eventually qualified in the instrument and elec trical trades to group 3 level. Several of these RCEME tradesmen qualified in both the instrument and electrical trades during their training at RCAF Stations.

In October 1961, the author was posted to the Light Aircraft Maintenance Flight at the Canadian Joint Air Training Centre (CJATC) at Rivers, Manitoba. The Instrument Electrical Section, at this early stage of its life, consisted of three electrical technicians, two Instrument technicians, two metal lockers located in one corner of the hangar floor, one 0-3 volt dc voltmeter, one power-supply checker, one pitot static system checker and a small selection of wire, vinylite tubing and various types of terminals. With this limited amount of equipment RCEME leaned heavily on the RCAF units at CJATC for support in the use of their equipment (for which we are indeed in debt to them), and for the manner in which they so ably co-operated with RCEME. Perhaps this could be considered the beginning of integration.

The Army Aircraft strength at this time was 24 CH112 Nomad helicopters, 3 H5 helicopters, 5 Chipmunks and approximately 14 Cessna L19 fixed-wing aircraft. After much cajoling and pleading, a room was given to the I&E Section so that test equipment, which had been obtained from an RCAF unit transferred to Ottawa, could be set up to carry out normal maintenance. As space was at a premium in the hangar, the Tels Section moved in with the I&E personnel, and much activity was observed as both sections began setting up their various pieces of equipment.

Extensive training programs were carried out by the I&E Section to train personnel in the various functions required in aircraft instrument and electrical maintenance to support the CH112 helicopters slated for NATO service in NWE in 1962.

It was decided to combine the instrument and electrical trades into one aircraft trade known as Aircraft Instrument and Electrical Technicians. New trade specifications were drawn up, and training was conducted at CJATC, to cross-train all the I&E personnel to the new combined trade, and many hours of lectures and self-study were carried out by all personnel. This training is still in progress to cross-train I&E personnel returning from NWE, and also I&E technicians who are employed in the various aircraft field units throughout Canada.

As time passed, new faces began to appear in all aircraft trades, Light Aircraft Maintenance Flight was changed to Army Aircraft Maintenance Unit, and with the advent of the new Army CH113A Voyageur helicopters at CJATC, it became necessary to move to a larger hangar, and again training was stepped up to a high degree, to train technicians to care for the more sophisticated helicopters. Special factory courses for the instrument electrical trade were held at Morton, Pennsylvannia, and these specially-trained RCEME personnel then returned to Canada and conducted courses to train more technicians. Much valuable experience has been gained by RCEME personnel at CJATC in aircraft maintenance in-job training, particularly during the frigid winter months, when many queer snags appear in the aircraft instrument and electrical systems.

The RCAF was called upon to conduct Group 1 Aircraft Instrument and Electrical Technicians courses at the RCAF School, Camp Borden, and successful trainees were graduated in the summer and fall of 1965. The 'blue job' instructors are to be congratulated on the fine way they trained our 'brown jobs' as they are proving to be highly skilled technicians.

Many new pieces of test equipment have been added to the I&E inventory which are entirely foreign to the ground trades. Test equipment such as stability augmentation system testers, which are used to test and adjust the SAS system, a trim system used to make a helicopter perform like a fixed wing aircraft; extensible link testers, used to test the extensible links, which are part of the flight control system; and a magnehelix tester, used to test the longitudinal cyclic trim actuator in conjunction with the speed trim system. Further test equipments used on aircraft systems are

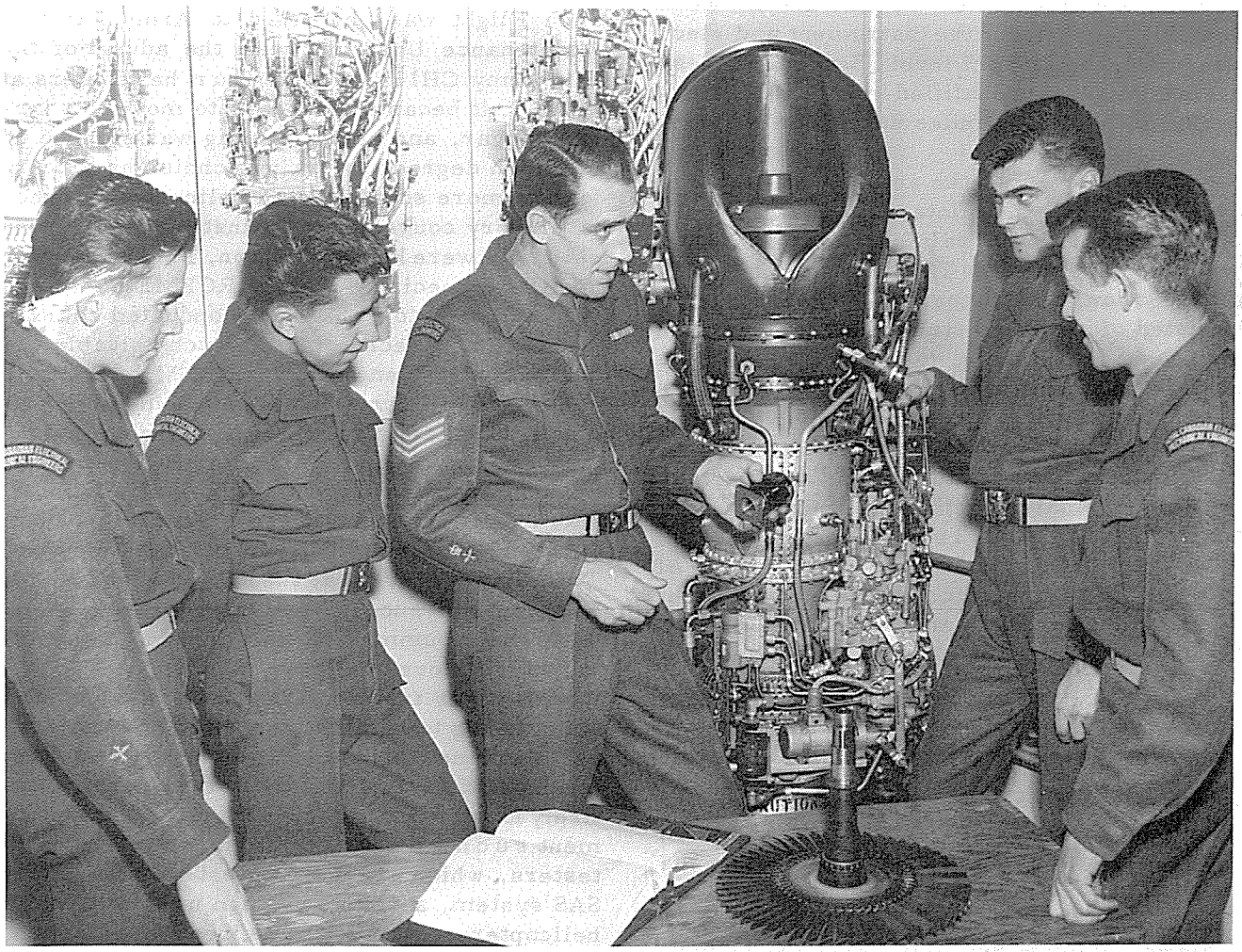
jetcal analyzers, AC generator supervisory panel testers, pyrometer testers, engine torque testers, flux valve testers, pitot static system testers and the normal AC and DC voltmeters and 400 cycle frequency meters.

Another responsibility of the I&E section is maintenance and repair of the F95 Vintin aircraft camera and its associated control systems. This has been a fairly recent addition to our trade, and classes have been conducted at our I&E Training Section to teach the skills required to carry out unit maintenance on these cameras and their control systems.

The CH112 and CH113A helicopters use 24 volt nickel cadmium batteries in their electrical systems, and maintenance of these batteries is another function of the I&E trade. A special battery room was constructed in the hangar in which a nickel cadmium battery pulse charger has been installed, and complete servicing of this high value battery is carried out by qualified personnel.

Again, RCEME tradesmen have proven their skill and adaptability, by moving into a new field of work and, by much devotion and hard work, have made a success of their new trades.

Canadian Forces Base, Rivers, photos



The General Electric T58 turbine engine powers the CH113A helicopter. Sgt Gil McNeil teaching the tach generator to a class of Gp 1 tradesmen. (l to r) Cfn J Robertson, Cfn AG Dreaver, Sgt McNeil, Cfn GA Cooper, Cfn WE Brydges.

## MAINTENANCE TECHNIQUES AND QUALITY CONTROL SECTION

by

Lt KC Pirt

The title of this section is ocassionally referred to as the "Rabbit Control and Nit-Picking Section" and although it may seem 'top heavy' when the rollcall includes Lt KC Pirt, Sgt A Thomas, Sgts JM Ehler, JT Martin and J MacFarlane with L/Cpl WA Hamilton you can realize that this is not true. A short resume of duties performed, reveals that these NCOs are held responsible to:

1 Ensure safety practiced in the aircraft servicing and maintenance;
2 Weigh aircraft and perform symmetry checks;
3 Carry out supervisory and spot checks on aircraft undergoing maintenance;
4 Check maintenance records;
5 Control POL, and periodic inspection of tools and equipment;
6 Perform independent inspections of repairs and adjustments by the technicians.

Modifications, prototyping improvements and conducting related trials from aircraft operators across Canada and Europe, are channeled into MTS files. Like our counterparts in the ground trades, we find that design improvements and modifications are invariably forthcoming with aging and new equipments. Although we may tend to forget that vehicle repair was our fledgling trade, the office of DEME recently jolted us out of the air. The accompanying photo brings out the fact, that our resources will always be available to conduct trials on such worthwhile projects as this Suggestion Award "Tire Bead Breaker". ---Our congratulations to the originator.

PROTOTYPE HIAB TIRE BEAD BREAKER IN OPERATION

RC & NP Section: (l to r) Lt KC Pirt, Lcpl WA Hamilton, Sgts J McFarlane, JT Martin, JM Ehler and A Thomas DND Photo

# *RCEME SENIOR NCO TRAINING*

By Major RF Fendick

BACKGROUND

During 1965-66, the RCEME School conducted what may well be the last complete Senior NCO Courses run on a strictly Corps basis. Three nine-week courses were conducted between Oct 65 and Apr 66, and of 90 candidates who began courses, 83 junion NCOs qualified.

Each course was divided into Part A and Part B. Part A, the common-to-all-arms training portion, was run by Regimental Company of the School. Part B which covers special-to-RCEME material was conducted by Management and Regimental Companies. Successful completion of Part A is a pre-requisite for Part B.

Subjects covered included the following:

PART A

Communications (voice procedure, operation of sets)
Drill
Leadership, Man Management
Map and Air Photograph Using
Methods of Instruction
Military Law
NCO Duties
Nuclear, Biological and Chemical Warfare
New Equipments (incl familiarization visits to all trade companies)
Organization and Tactics
Range Courses and Duties
Weapons.

PART B

RCEME Workshop Procedure
Human Relations and Introduction to Management
RCEME Field Operations
RCEME Operations in Canada
RCEME Unit Technical Stores Accounting

---

Asgt Lecroix Asgt Wing display teamwork in setting up an arctic tent during "Exercise Shuffle Off".

No snow makes for tough sledding but the section cheerfully moves its equipment a short distance to the bivouac area, during "Exercise Shuffle Off". The sleds normally are used for ease of pulling equipment over the snow, but in this case they were good for keeping section gear intact, and were moved from one point to another by truck. (l to r) Asgt RW Armstrong, Asgt Meharey, Asgt Pointer, Asgt Milton, Asgt Whychuck, Asgt Portelance.

Junior NCOs nominated for the Senior NCO Course were expected to carry out a good deal of preliminary private study, and to undergo a two week's Refresher/Assessment Course prior to attending the Senior NCO Course. Most of the subjects covered during Part A of the course were Recruit and Junior NCO Course level material. Therefore for the most part these were used as vehicles for Mutual Instruction periods; students were expected to be thoroughly familiar with the subject matter. Only a small percentage of new, higher-level material was instructor-taught. Training was kept as practical as possible in all subjects.

A highlight of each course was the one week spent in the field. As courses were conducted in the period from late fall to early spring, arctic kit was used. In Kingston one cannot always depend on steady winter weather, so that a given course might encounter moderate cold, with or without snow, wet conditions, etc. Most students were surprised to find that, with proper planning and preparation, good drills, and careful day-to-day organization, they were able not only to survive these conditions, but to train actively by day and night and to remain comfortable. The field training consisted of minor tactics at the section and platoon level, with emphasis on the fact that the tasks being practiced were those that any RCEME NCO could expect. In UN operations, in limited war or in total war, infiltrators, parachutists, partisans and geurillas can be expected to harrass the support areas; the services, including RCEME, must be able to deal with them.

Although many RCEME candidates looked forward to the week in the field with some reservations, by the time the training mess dinner was held near the end of each course, most of the anecdotes, jokes and camaraderie could be traced to the field week.

Leadership training, and assessment of leadership ability, formed a major part of the course. Instruction was in the form of mutuals, syndicate discussions, cloth model or outdoor exercises. Students were expected to know the facts available from the reference manuals before the period, so that instruction could be devoted to clarifying unclear points, and particularly to learning and practicing the application of the theory to typical practical problems. Most students finished the course with a new confidence in their knowledge, ability to reason and powers of expression.

Asgt Pointer explains to the DS where he plans to set up his all round defences during "Exercise Shuffle Off". (l to r) Ssgt WR Quinn, Asgt J McKay, Asgt Pointer Asgt DA Ford, Asgt H Pettigrew.

THE FUTURE

With the integration of the Forces and the creation of Training Command, studies have been carried out of many aspects of training, to determine the most effective, most practical and most economical ways to produce the standard of servicemen required.

A study of Senior NCO Training has resulted in the production of a standard course package which must be passed by all Army candidates. It will consist of 6 1/2 weeks Part A (common-to-all-arms) course, and up to 3 weeks Part B (special-to-corps) course. The full details of the course are not available at the time of writing, but all concerned will have the whole story sometime about Aug 66. The following are some of the facts known so far.

a. There will be a formal pre-course examination which all candidates must pass to be eligible for Part A. It will cover at least Leadership as covered in the new Forces Leadership manual, and Map Using.

b. RCEME candidates will take the Part A Course in 1966/67 at the RCS of S Kingston, Ontario. Part A will no longer be run on a Corps school basis, but only at

( continued on page 18 )

## "WITHIN THE FRAMEWORK OF EXISTING REGULATIONS"

Someone in their wisdom at Canforcehead saw fit to issue a revised EIS No 581 dated Oct 65. This EIS authorized the use of 6515-00-864-8733 Syringe, rectal, infant, 3 oz cap, in place of 5120-00-254-4612 Blower in 5180-21-105-3820 Tool Kit Instrument Mechanics General.

This unit in due course was notified of the revision and on 1 Feb 66 demanded qty 3 Syringe rectal infants 3 oz cap to complete C of V for Tool Kits Instrument Mechanics General.

Following the normal "framework of existing regulations" the DIV was passed from this unit to 8 AOD. As this item apparently was not an AOD mission the DIV was apparently passed "within the framework of existing regulations" to 17 ROD, Edmonton, Alberta.

The ROD "within the framework of existing regulations" apparently reviewed the demand and concluded that this article was a medical store and not their mission. Again "within the framework" the workshop demand was passed back to BC to the MSD at Chilliwack.

The MSD "within the framework of existing regulations" after reviewing the demand had two questions, ie.

> Under what authority was a RCEME workshop demanding medical tools, as their trade was electrical and mechanical and not medical?
>
> Under what authority could the qty 3 Syringe rectal infants 3 oz cap be local purchased (assuming RCEME had an entitlement as this apparently was an LPO item.

The MSD Chilliwack "within the framework of existing regulations" apparently requested clarification of these two points from the Regional Surgeon, Esquimalt.

The Regional Surgeon's Office Esquimalt before they could answer the second question, required the answer to the first question so they contacted the Sub-Regional Surgeon Vancouver by telephone tie-line.

The Adm Officer of the Sub-Regional Surgeon's Office, Vancouver, telephoned the OIC of the RCEME Workshop (as his signature was on the DIV) to obtain the answer to the first question. Well? However, remembering your quote "within the framework of existing regulations" I realized even with integration, amalgamation, imagination and frustration there must be a system. I politely (?) referred the Adm Officer to 8 AOD, as the original culprit in this instance was an EIS similar to which the Auditors have observed on during their last two inspections of the unit.

Being curious I followed up by obtaining the local LPO price (.72¢ each) and at a Wednesday Luncheon broached the subject to both 8 AOD and Med Adm Officer. I just then appreciated your appraisal of the RCOC system as I was told that existing regulations were being followed. I must say that after the CO of 8 AOD saw the humor in the situation and after I had remarked that it was a good thing the instruments we had were not constipated, he - over objections of his officers - instructed them to purchase locally.

Approximately ten days later we duly received qty 3, Syringe rectal infants 3 oz cap however regulations "shall" prevail as the certified true copy of DIV 1967 indicates that the 3 Syringe Rectal Infant 3 oz cap were purchased by MSD on LPO 569179. To finalize this transaction I have had to make certified true copies of the DIV to complete MSD records as there were not enough copies of the original for distribution to satisfy both RCOC and MSD "accounting regulations".

--JE Brewster Capt

TRAINING Continued

a limited number of designated schools.

c. Part B will follow the Part A, and for RCEME will be conducted at the RCEME School.

It is not expected that the general aim and scope of the course will change drastically. It can be accepted that RCEME must continue to select only candidates of the highest calibre and that these men must be thoroughly grounded in all recruit and junior NCO skills and knowledge before they leave their units for the Senior NCO course.

# FROM ISERLOHN WITH LOVE

By Lt JI Hanson, 4 Fd Wksp

The condemnation of a Steam Jenny is a difficult process. The Tech Adjt of the LdSH (RC) found this out when he wanted one of his replaced. Much liaison with 4 Fd Wksp via its Control Officer took place before the PCC was finally raised. The resulting tangled web of intrigue might never have been revealed fully, had not the Staff Officer Materiel Maintenance (formerly DADEME) released certain information from his files to clarify the situation. Here then, is the true story.

* * * *

The atmosphere of a control office is overwhelming at 0930 hours. It is composed of cigarette smoke, eau de lysol, 4711, and the unmistakable aroma of unsigned 2149's. James "Monkey" Rentch, Inspection Number .007", breathed in this heady mixture, and glanced nervously at the closed door of Control's inner sanctum for perhaps the 60th time in 10 minutes. Something big had to be in the wind to get Control into his office this early in the morning. Right now he was probably speaking on his padded scrambler to SOMM and a dangerous new assignment for .007" would undoubtedly result. Nerves tense, Rentch lit one of the special cigarettes (made for him by Frost of Jarvis St) with his RCEME crested lighter.

James Rentch was one of only three agents in the whole Inspection Organization to hold that ultimate status symbol, a double-O tolerance number that gave him the right to condemn on active service. He had earned that right the hard way - Jr NCO course, Sr NCO course, AI RCEME course, and finally the big one - the Tiffy course. Rentch smoothed some imaginary wrinkles from his flawlessly tailored coveralls (made for him specially by Ord of Highbury Street in London, Ont) and smiled as he recalled some of his previous assignments. There was the Cracked Block Caper at Hemer, for one. Then the Camshaft Case at Fort St Louis. But both paled by comparison with the Valve Job at Fort Henry. He sucked in a lungful of the smooth, rich smoke and adjusted his rope tie with the handmade contemporary op art oil stains. Yes, it was a good life.

Suddenly Miss Pearlygates, Control's delectable secretary, was giving Rentch the high sign. Taut as spring steel, he strode through the door into the lair of the man known to his staff as "The Rock".

The office itself was sparsely furnished. Its sole inanimate contents were a battered bookcase holding a well-thumbed collection of "Playboys", a somewhat tarnished golf trophy Control had won, and the padded telephone. Behind an overladen desk sat Control himself. He was simultaneously lighting a cigarette, scratching his head, yawning, adjusting his belt, buffing the golf trophy, and signing 2149's. Control was a well organized man.

"Sit down, Seven Thou," said Control, laying down his pen. "I've got something ticklish for you this time." Rentch had realized this when Control addressed him by his number instead of his name.

"We've got a spot of trouble down Iserlohn way," continued Control. "Everything was a hundred percent down there till last month. Then all at once we lost three good agents - two backloaded, one condemned. The only factor we could turn up common to all cases was a female named Jennie. She was known to all three agents. We don't know yet if she works for the opposition, so I want you to check her out. See Q to get your kit, then get right down there. She's usually found at Howie's Place in Iserlohn. Report to me as soon as you get results. Oh, and Seven Thou," blushed Control, "make sure you take a feeler gauge along."

Q had his usual bag of tricks. The first item was a new improved vacuum gauge with a waterproof, luminous dial. Next was a tricky, split level steel box, readily concealable about the body, containing sixty-four pounds of automotive tools. A hollow tie clip in the shape of a RCEME badge contained a copious supply of carburetor cleaner. But Q's real piece de resistance was the vehicle Rentch was to use. "Looks like an ordinary three-quarter from the outside," said Q proudly, "but inside this baby packs a few surprises."

Q spoke the truth, as Rentch discovered on inspection of the magnificently tuned machine, gleaming in its coat of olive drab with tricolour tac signs. There was a buckshee heater, originally slated for the CO's jeep, mounted under the seat. One of the studs on the dash cleverly concealed a cigarette lighter. A sec-

...make sure you take a feeler gauge along"

ret pocket in the door held a forty-ouncer of rye. The gear-shift lever knob had been hollowed and held two ounces of snuff. And, ultimate luxury of all, there was an ashtray mounted over the ignition switch! "Don't see how I can go wrong with a sports job like this," said .007" gratefully as he signed the necessary forty-three forms in sextuplicate. Then, after shaking Q's hand, Rentch got behind the fur-covered wheel and pressed the self-starter with his alligator-skin combat boot. Miraculously the engine roared into life at the first attempt, and the road to Iserlohn lay perilously waiting.

The trip down was almost uneventful. Near Wickede, the enemy tried to cut .007" down. They roared out of a side-road in an APC disguised with 13 tac signs and tried to force him into a tree. Rentch merely shifted into overdrive and easily left them behind as his truck accelerated up to 40 mph in a matter of minutes. He peeled the cigarette butt off his lower lip and arrogantly flicked it into his slip-stream toward the APC which was receding swiftly in the rear view mirror. The fools!

He pulled up in front of Howie's Place in Iserlohn a mere 2 hours after leaving Soest. He adjusted his compression gauge in its clam-shell shoulder-holster, then pushed through the swinging doors into the smoke within. Sliding into a seat at the bar, he turned to the barman. "I'll have a RCEME martini, please. Very dry. Eight parts anti-freeze to one of number ten oil. Stirred, not shaken." The drink in his hand, he then turned his gaze upon the crowded room to see if he could see Jenny.

That one in the corner had to be her! Magnificently formed manifolds were accentuated by a chromed rocker cover with just the

( continued on page 23 )

IS IT SUITABLE?

## INSTRUMENT REPAIR EQUIPMENT IN 1 FD WKSP

Over the past year the test equipment which has been issued to this unit has been of the type designed for static shops. All tests and adjustments for angle measuring instruments and sighting equipment as laid down in the EME Manuals require this type of test equipment. Personnel in the unit must be trained on this type of equipment if they are to receive any advancement in the trade; therefore we must use this equipment if we are to repair the instruments.

Our latest piece of test equipment is the Open Collimator. This consists of a chart and lens. The lens is mounted on a tripod 10 feet from the chart and provides an artificial infinity for the instrument under test. The instruments are positioned on the tripod behind the lens. This required focal length distance together with the tripod and working distance behind the tripod make up a working area of 14 feet in length as illustrated. The test equipment must be solidly mounted on the tripod as we are working with sensitive bubbles and any movement will make it impossible to carry out the tests.

The optical van which was just received by this unit provides levelling legs to give stability to the box of the van. The vehicle was set up in the area with the levelling legs lowered and it was found that within an hour the levelling legs had settled into the ground sufficiently to shift the levelling bubble of a transit mounted in the van some 60 seconds or 1 minute. Also when the M-62 wrecker was driving in the area it tended to make the van very unstable, shifting the levelling bubble continuously. Also while set up in the area there was an afternoon with a moderate breeze blowing. The slight breeze tended to play havoc with the levelling bubble on the transit.

The open collimator testing system requires that the collimator and lens be separated by the focal length of the lens. This is measured to the nearest tenth of an inch, say 119.1 inches. This is done with the use of plumb-bobs suspended from both equipments. The measurement of the focal length requires an accurate measurement in the horizontal plane. This would indicate the use of a horizontal plane. The van provides for a working area of 4 feet which would require the open collimator to be located outside of the van making accurate measurement very difficult.

The different instruments which require adjustments and calibration are listed below with the equipments requiring the use of the open collimator noted. Using the van makes several of these tasks very difficult.

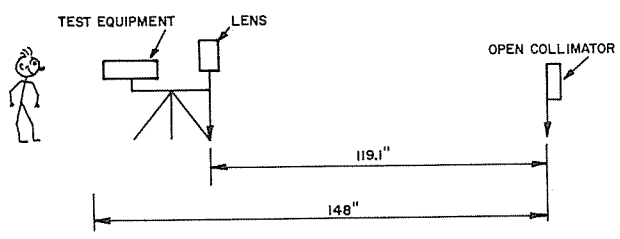
The van is a metal container and thus would not facilitate the calibration of the compass prismatic. This requires outdoor facilities to work in.

The aiming circle and the theodolite require the open collimator in conjunction with the compass to adjust and align the axis. This again should not be done inside the van. The aiming circle also has a 30 second bubble which requires a delicate setting and stable mount.

Sights periscopic used on the tanks and the APC M113A1 amount to approximately 50% of the workload of the Instrument section. This equipment requires the use of the open collimator test equipment.

The instrument Section at present does not have facilities for decontamination work. That is, working with the ultra-violet lamp to detect the contaminated particles. Therefore they cannot work on compasses or speedometers.

The optical van is equipped with a watchmakers bench with the required test equipment and repair facilities. This takes up about 1/3



the room of the van. The EME Manuals specify that watch repair is not a field repair but is a base repair and thus there is no requirement for the watchmaker's facilities in the optical van.

## SOLUTIONS

Due to the working space required it is advisable that Instrument section work in a semi-static location. While in our present location they can work in Hangar #1 and 215 Workshop. While in Camp Wainwright they can work in 229 Workshop. Both 215 and 229 Workshops are equipped with more test equipment than Instrument Section now have.

The van could be used for inspection and on-the-spot unit repairs during the concentration. Minor repairs and adjustments can be made at the units, as the bulk of our equipments, eg, sight panoramic, mounts, and periscopic sights can be tested while mounted on the parent equipments. Survey instruments can be tested in the field using outdoor methods.

Experience has shown that a good shelter is suitable for most of our instrument work. The shelter must be well made and must have a sewn floor to keep out as much dust as possible. It would require an exhaust fan and a filtered inlet. With this set-up the tests and adjustments plus most of the mechanical work could be done in the shelter and the optical van used for cleaning and sealing of instruments. With an insulated shelter and a good heating arrangement it may be possible to use this set-up during the winter months. The temperature of the shelter would have to be constant to prevent breathing and sweating of the instruments. Personnel would have to work with bare hands and a minimum amount of clothing so a good heating system would be necessary for winter work in a shelter.

## INSTRUMENTS TESTING CAPABILITIES IN OPTICS TRUCK

1. Theodolites
2. Aiming Circle
3. Sight Unit's
4. Telescope Panoramic
5. Compass Prismatic
6. Range Finders
7. Telescope Sighting
8. Binoculars
9. Binoculars Periscopic
10. B. C. M. 65
11. Periscope Tank
12. Sight Periscopic
13. Telescope Observing Sniper
14. Telescope Sighting
15. Telescope Sniper
16. Telescope Elbow
17. Telescope M90D
18. Telescope Observation

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Effective 1 Oct 66, all B F G (Cdn) registered POMC will be equipped with front seat safety belts. The installation of rear seat safety belts will be optional, but encouraged.

Owners of vehicles will be responsible for purchase and installation of safety belts. MLS have arranged to stock various types of safety belts which may be purchased at cost price.

Installation of safety belts may be undertaken by commercial firms or by unit RCEME personnel in off-duty hours. When RCEME personnel install safety belts, the owner of the vehicle is warned that no claim may be made against the Crown for unsatisfactory work or damage to his vehicle.

-The Beaver

"Any unwarranted infringement on a soldier's free time is inexcusable".

General Omar Bradley

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"The proper persons to be recommended for quartermasters are active sergeants, for His Majesty does not think the office very fit for men of better extraction".

King George III 1775

and on the same subject a lesson to quartermasters of the ~~British~~ Canadian Army:

"The standing maxim of your office is to receive whatever is offered you, or you can get hold of, but not to part with anything you can keep".

# LETTERS

Sir:

Attached is some food for thought that might warrant publication in the bulletin. It was prompted by recent articles on management published in the last two editions. (See "From Clerk to Control Officer, Page ).

I have felt for a long time that the clerk trade could contribute more to the corps if given the opportunity and it seems to me that a whole new field could be opened up under the heading of management.

As I have pointed out, RCEME clerks are misemployed as far as their formal training is concerned which is unfair to the man when he is placed back into an administrative capacity after many years in control. Therefore I have decided to forward a copy of this submission to the Suggestion Award Committee.

(J D Dunsmore) Sgt

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FROM ISERLOHN WITH LOVE continued

right amount of oil on it. Her high-tension leads were upswept in the latest style. Her radiator was breathtaking. James Rentch strolled nonchalantly over to her corner "Hello, Jenny," he growled throatily, reaching down and fondling her carburetor idle adjustment screw. She purred at him, but he could tell she was racing her motor.

"What do you know about three missing RCEME agents?" Rentch asked relentlessly. She said nothing, but her points were breaking alarmingly. Knowing that he had her with her valves down, .007" threw caution to the winds. Swiftly, he pulled his feeler gauge and tested her cylinder clearance. Just as he suspected! It was excessive - she must be an enemy agent. Drawing his pen and tags, Rentch condemned her on the spot.

Later he phoned Control. "The case is all wrapped up, sir." Rentch had to shout to make himself heard above the clatter of dice and riffle of cards in Control's office. "Jenny is on her way to Wetter right now. We shouldn't have any more trouble in Iserlohn". Control was so pleased he paid .007" the ultimate compliment. "End of story, is it, Seven Thou?" said the Rock, "100 percent".

Sir:

I cannot let Oldster's remarks concerning my capsule history of RCEME pass without comment: (See Letters, Jan 66) particularly since they inadvertently illustrate some of the points I was trying to make.

About the history: my information came from Lt Col Hodgson's history of the Corps, and the colloquial history of the RCASC, "Wait for the Waggon", as well as other sources. I am confident that these well-documented sources are more accurate than the memory of any individual, and that my few paragraphs are an accurate reflection of their contents.

In addition, to state that "practically all of the functions of the new Corps" were already being performed by the RCOC prior to 1944, with the clear implication that these functions included most of the army repair and maintenance activity at that time, is to ignore the existence, and the work, of the many excellent tradesmen in other Corps in the army (RCASC, RCA, RCAC, RCIC, to mention only a few). Yet these men were a very important part of the repair and maintenance scene in 1944; they and their successors, now under the RCEME banner, form virtually the backbone of the Corps today, as I have pointed out elsewhere.

Note that above I said:" ... tradesmen in other Corps..." Apparently very few of our officers came from Corps other than RCOC, in 1944 or since. I contend that this has had a narrowing effect on Corps policy, and that the remarks in oldster's letter concerning the greater efficiency of the proposed principle of operation and the difficulty of explaining technical matters to a layman are evidence of this narrowness.

I believe that it is only too easy for technical people at any level who are isolated from users to a greater or lesser extent, to become narrow in their thinking, to feel that the mechanical condition of equipment is more important than its use, to feel that efficient use of plant and manhours are more important than user requirements. In support of this contention, let me quote from another article in the January issue: " The value of the consumer's point of view is often very much overrated". This from a member of a Corps which exists primarily to provide service to the consumer.

Despite the tone of my reply, which I hope he will not take amiss, I enjoyed Oldster's letter and appreciate his being interested enough to write.

Peter Johnson

# SENNELAGER '66

Sennelager! The very word itself rings with the clash of arms and breathes of the mysticism of Teutonic legend. Thus it is with mixed emotions that the men of 4 Field Workshop face the annual concentration in the shadows of the Teutonburger Wald. A memorable concentration it proved to be this year.

Things kicked off on the week of 6 Jun with a BAA exercise. The blackness of 14 Jun was punctuated by flashes of gunfire as the shop set up in a farmyard and high wood for a cold night. Everything went well, however, and a misty dawn was followed by a hot day to thaw everyone out.

Two days of military and sports competition followed. A team from the unit, composed of Sgt Laird, Cpl Clarke, Lcpl Gates and Cfn Atkinson won the brigade jeep rally on 17 Jun. Our other sports teams didn't fare as well, but put out a good effort. The whole competition gave us a bit of a change from our usual routine.

A pleasant event occurred during the first week which received universal approbation. Our friendly neighbourhood 2 IC, Capt MC Johnston, was promoted to the rank of Major. Congratulations, sir. At the same time, our Aircraft Platoon Commander, Capt FG Hutson, was warned that as of 1 Sep he too would leave the gay carefree ranks of his fellow captains and likewise become a field officer. A keg of ale was broached in the men's canteen by these two individuals in honour of the present and future event.

The second week of Sennelager saw the workshop deploy tactically for four days on a production exercise. This caper involved many alarums and excursions, a few sleepless nights and much bad language. Who can forget the dawn patrol of Ssgt Birdsell's Green Berets on the night of 22 Jun or the fearless charge of Ssgt Haas' Light Brigade through the unit lines, thunderflashes exploding and rifles firing, the very next night? A special bouquet goes to our capable cooks who kept us well fed throughout a trying period. The climax of the whole show occurred on Thursday, 23 Jun, with a visit to the unit by General Sir John Hackett, Commander of BAOR and a former Colonel Commandant of the REME. The General was able to see the unit tactically deployed and dug in and still turning out work. He even had his watch calibrated by Weapons and Electronics Platoon. Most impressive were probable Vehicle Platoon, who had erected their Frische Shelter in a small clearing, and Aircraft Platoon, who were working on a helicopter they had dragged into the trees. We hope the General was as impressed with us as we were with him and his keen grasp of matters RCEME.

On Saturday, 25 Jun, the unit was awarded a rare honour. At a special parade in Paderborn, ISSM Bty RCA presented blaques to those units which they felt deserved special recognition for outstanding support to the Bty over their past few formative years. The only Canadian unit so honoured was 4 Field Workshop RCEME. It is an honour we are very proud of. Major Bateson accepted the plaque on behalf of the Workshop, and as a final service to the missile gunners, RCEME provided the pen for the signing of the Change of Command Scroll.

Sennelager is also a sad time, for it is then that we start to say goodbye to our comrades of the past three years as they rotate to God's Country. While they are too numerous to mention by name, most of them have left their mark on 4 Field Workshop in one way or another - as part of our sports scene, social activities, or merely another statistic in the Brigadier's Crime Rate Survey. At any rate, we'll miss them all and hope to serve with them again some day.

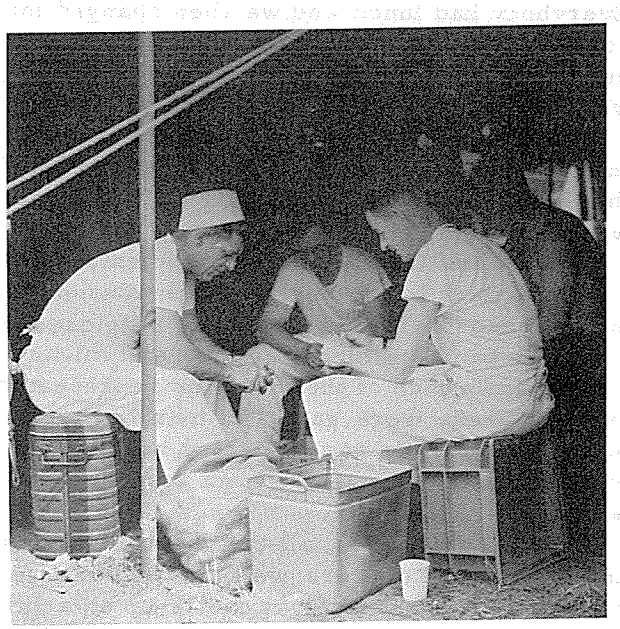
Brigadier Tedlie and General Sir John Hackett talk to two RCEME weapons technicians about the new anti-tank weapon. Cfn Wright and Sgt Ruggles are attached to 2 RCR. (DND photo)

Cfn Denis and Roualt of Vehicle Platoon repairing generator. (Cpl Gebicki photos)

Batman, RCEME style. Cfn Sharman tries the Recovery Platoon Death Slide as Cfn Young looks on.

Volleyball Team, Sennelager style. In front, Cpl Allen and Cpl McCabe. Rear, left to right, Cfn Heidekamp, Cfn Beddow, Capt McCulloch, Lcpl Jones, Cpl Tipping.

Some of our hard-working cooks, and one lonely KP. Left to right, Pte Buckley, Cpl Bernier, Cpl O'Malley Cfn Willington.



# RCEME REPRESENTING CANADA AT A NATO PARADE

By Lt HP Martel OIC Maint Pl 2 R22eR

Ten kilometers east of the town of Aachen (Aix-la-Chapelle), Germany, stand two small towns. Each of the towns houses a military camp. Eschweiler houses the German Army Rocket School and Stolberg houses the Belgique Army Queen Astrid Camp. To show NATO solidarity and co-operation and at the same time show the towns that their hospitality was appreciated, it was decided to hold a military pageant. The Belgique and German Garrison Commanders were to be the hosts and organizers.

An invitation was extended to the Netherlanders, Americans, British and Canadians. The parade was set for the 7th May. Upon receipt of the invitation, HQ 4 CIBG decided that a detachment from 4 Fd Wksp RCEME would make an excellent showing. Capt G. Pothier was to be the administrator, myself the Guard Commander, Ssgt DG Birdsell, the Guard NCO. CSM 'Budd' Hardy was the strong hand that brought the craftsmen to the finest group of soldiers in the parade. He did an excellent job and a big hand goes to him for the success of the Canadian detachment.

After two trips to Aachen for planning, the whole detachment finally left on the morning of the 7th May. After a three-hour trip on the Autobahn, we arrived at our host unit camp in Eschweiler, the German Army Rocket School. Everybody had lunch and we then changed into our parade uniform, which was battledress with miniature Canadian flags sewn on the sleeves, white belts and white slings on the rifles.

At 1400 hours, we set off for the parade in Stolberg. We formed up on a side street and then marched on the town square. The parade was formed of German, Belgique, British, American and Canadian detachments. The Netherlanders had to decline the invitation for major reasons. There were also a Belgique and a British band. Eminent civilian and military figures from each of the countries represented on the parade were guests of honour of the town. The parade was inspected and we then marched past through the town to a dispersal point about 1 km away.

After the parade, all the guests of honour and the parade officers were invited to a reception held in a medieval castle up on a hill overlooking the town. At the reception, Colonel Bourgeois, representing the Commander CANF (E), accepted a painting of the town as a gift of appreciation from the Bürgermeister of Stolberg. The painting was subsequently presented to Major P Bateson, CO 4 Fd Wksp, by Brigadier AJ Tedlie. Eventually the same painting will be presented to the RCEME Corps Museum.

After a "frugal" (?) meal and a good German beer, the detachment started to prepare for the "Torchlight Parade" in Eschweiler. When darkness fell, the different detachments formed up. The Canadians were escorted on each flank by German soldiers carrying torches. It was a very good parade, Canadians drawing the applause of the crowd along the route by their excellent marching and sharp rifle movements.

When the parade was over the members of the detachment dispersed for a quick snack and beer, in some of the town Gasthauser. When everybody was back we headed back toward Soest, glad of a job well done and the gift of a glimpse of Canada that the inhabitants of Stolberg and Eschweiler will never forget.

Brigadier Tedlie presenting painting to Major Bateson.

Opposite page

RCEME parade being inspected at Aachen by a German dignatary accompanied by the guard commander, Lt HP Martel.

# Rotation Time in Germany

By Ssgt DG Birdsell

As I was sitting here in my tent in Sennelager today, up to my ankles in water, I thought; While production is at a low ebb, it would be an opportune time to get away a letter to the Bulletin, telling them of the fine "Rotation Ball" held in the Sergeants' Mess, Fort Chambly, on 28 May 1966.

No doubt most of the warrant officers and Sr NCOs in the Corps are aware of this annual event. It is one which members, especially those rotating, look forward to with great enthusiasm. It is one of the main mess functions of the year and one which finds almost 100 percent of the mess members attending.

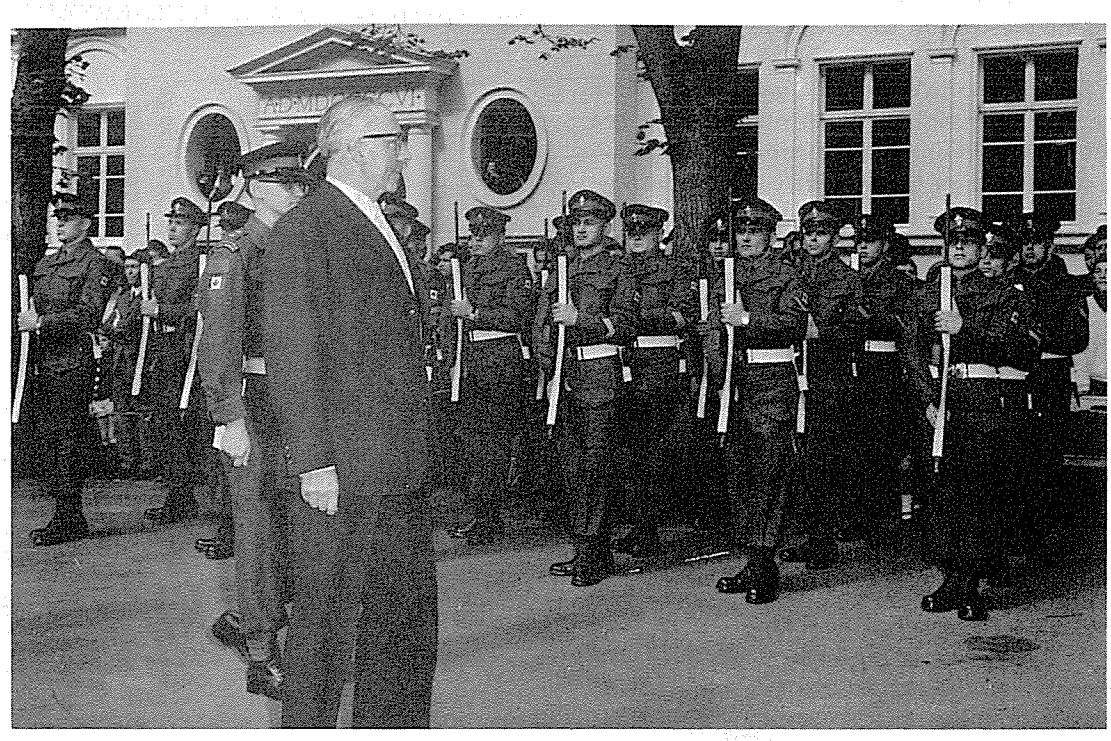
Fourteen of our members, along with their wives and families, are rotating soon. They will be missed by us who are staying, not only for their good comradeship but for the fine work they have done for the mess. I'm sure they will miss the mess functions they have attended during their tour and I can't help but wonder how they feel about leaving this fine weather behind. ( The water has risen two inches since I started this. )

Our guests of honor for the evening, along with those rotating, were Major and Mrs P Bateson. Our CO was introduced by our PMC, Ssgt McDowell, and in reply, Major Bateson expressed his appreciation of the good work and co-operation he received during his tour here. In conclusion, he proposed a toast to the wives who, he quite truly stated, have contributed so much during our tour here. He is rotating soon to take up new duties in the "Good Old RCEME School".

Our ETSM, WO1 Walsh, very ably responded to the CO's kind remarks and then called on the V/PMC, Ssgt Birdsell, to give a brief resume on the rotating members. Lt Hanson, our very own Ian Fleming, had prepared some choice remarks on each rotating member for which he deserves a lot of credit. However, at the last moment just before reading these off, I found several changes had to be made and necessitated some fast "ad libbing". All in all, it was taken with great enthusiasm.

The dinner was followed by a dance and many hours of good fellowship. I'm sure we

( continued on page 28 )



# SPANNER SPEAKS

The final week of Sennelager saw 4 Field Workshop lose two of its valuable staff sergeants on the same day. However, we simultaneously gained two warrant officers class 2. Ssgt Atkins of the Electrical Section, Vehicle Platoon; and Ssgt Ross of the Radio Section, Weapons and Electronics Platoon, were both elevated to the warrant officer level on the same day. Also promoted was Cpl Taylor of the Armament Section, who is now sporting a well-deserved third stripe. Warmest congratulations to our two new sergeant-majors and new sergeant.

Since we last appeared in print we've lost one officer and gained another. Capt PG Pothier has left us for a new job at that big puzzle factory in Montreal, 202 Base Workshop. He will be missed by many people, both for his friendly smile, and skill as an instant piano player and tuner at critical moments. The new face belongs to Lt RN Fischer, who comes to us from that hotbed of experimentation, the Service Battalion. His fresh outlook will be a valuable asset to the workshop in the days ahead.

A pat on the back is in order to some of our single men. Almost on their own they've developed a small reading area and library in their quarters. While no one will mistake it for the Christian Science Reading Room, it does add a homey touch to what they affectionately (?) refer to as "The Shack" and provides a centre for convivial gatherings. What with the number of guitar players in quarters there is always some sort of entertainment going on. We understand things have really been swinging since Sennelager, anyway.

This week we would like to pay tribute to some of the unsung heroes of 4 Field Workshop, the hard-chargers of our Recovery Platoon. These people carry out necessary and often dangerous jobs at all times and in all weathers. Not only do they have to be good drivers - all their trucks are big brutes - but they have to be skilled mechanics too. Some of them have enviable safety records others in the unit would do well to emulate. For instance, Cfn Sharman recently completed his 20,000th accident-free mile and now is working for 30,000. When you consider that much of this mileage was driven in a 5 ton M62 Wrecker, often with another vehicle on suspended tow, you begin to realize how good these guys are. Next time your vehicle breaks down on scheme and you have to be pulled out of a bad spot, like as not these are the boys who'll do it for you. If so, take the chance to give the wrecker operator a hand with his job. And watch him at work - you'll probably learn something.

Congratulations to the workshop golf team of Capt EA Rochefort, WO2 J Kutyik, Ssgt DW Stevens, and Sgt K White, who have advanced another round in the BAOR Golf Cahmpionships with a win Friday last against 4 Div Regt RCT. With only two more wins this year our divot diggers become the BAOR golf champions. Carry on the good work golfers, we're all proud of you, and best of luck for the rest of the season.

Finally, we would like to welcome a new RCEME type to the workshop. Lcpl Joe Sullivan, a steward in our Officers' Mess, saw the light and transferred from the Canadian Guards to RCEME. We're glad to have him in the Corps.

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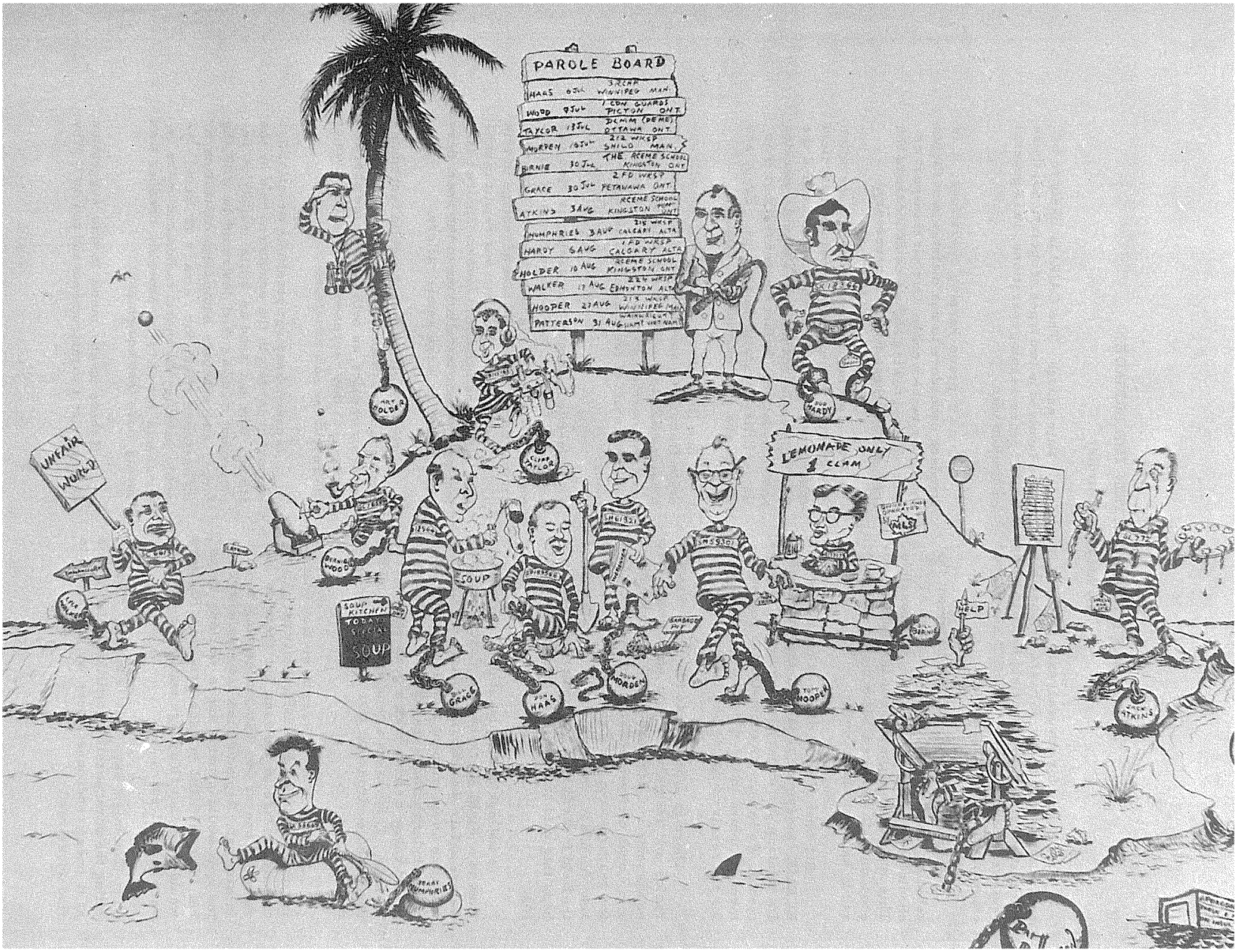
ROTATION continued

will remember this event in years to come.

I'm sure also there is more I could say on this Rotation Ball. Unfortunately, also this typewriter has not been 'wade proofed'. So before I get into my SCUBA equipment, may I say to those rotating, on behalf of 4 Field Workshop Sergeants' Mess, good luck on your new postings and AUF WEIDERSEHEN.

CAN YOU PICK THEM OUT?

This sketch of the WO's and Sr NCO's rotating back to Canada this year was done by Ssgt TA Patterson. Pat is a very talented and gifted cartoonist and during the past three years has produced some fine caricatures. Thanks, Pat. Now, can you pick them out? WO2 JR Hardy, WO2 TC Hooper, WO2 CE Taylor, Ssgt JW Atkins, Ssgt DT Haas, Ssgt GD Humphries, Ssgt AE Holder, Ssgt SD Morden, Ssgt TA Patterson, Ssgt LH Walker, Sgt AJ Birnie, Sgt WH Grace, Sgt BO Wood, and yes, you're right, at the top, wielding the whip, is Maj Bateson. Our apologies to WO2 WR Currie who is also rotating. At the time this sketch was done, neither Roy nor we knew he was rotating.


PAROLE BOARD
HAAS 9 JUL 3 RCAP WINNIPEG MAN.
WOOD 9 JUL 1 CDN GUARDS PICTON ONT
TAYLOR 13 JUL DCMM (RCME) OTTAWA ONT
MORDEN 19 JUL 2/2 WKSP SHILO MAN
BIRNIE 30 JUL THE RCEME SCHOOL KINGSTON ONT
GRACE 30 JUL 2 FD WKSP PETAWAWA ONT
ATKINS 3 AUG RCEME SCHOOL KINGSTON ONT
HUMPHRIES 3 AUG 2/6 WKSP CALGARY ALTA
HARDY 6 AUG 1 FD WKSP CALGARY ALTA
HOLDER 18 AUG RCEME SCHOOL KINGSTON ONT
WALKER 17 AUG EDMONTON ALTA 2 FD WKSP
HOOPER 27 AUG 2/6 WKSP WINNIPEG MAN
PATTERSON 31 AUG 2 FD WKSP
UNFAIR WORLD
SOUP KITCHEN TODAY SPECIAL SOUP
SOUP
LEMONADE ONLY 1 CLAM
HELP
MLS

# HOW MUCH REPAIR WITHIN THE BRIGADE?

By Major SA Girdler

Our policy for several years has been to repair everything as far forward as possible. Now that the structure of the field force is being reviewed, perhaps we in RCEME should re-examine some of our practices.

Few would argue with the statement that vehicles, particularly tanks, guns and APC'S, should be repaired as far forward as possible. This makes sense because it is obviously uneconomical to replace a heavy major equipment and to backload the casualty.

But what of some of the other things that RCEME tradesmen repair in the brigade? I am thinking particularly of radios and instruments. We have much sophisticated test equipment crammed into 3/4 ton and 2 1/2 ton Vans for the repair of radios and instruments.

There is a good case for replacing N/S radios and instruments with new or repaired equipments and backloading the N/S equipment to a Corps or Base installation. It is true that for years we have had a void behind the brigade rear boundary, but with the reorganization of the field force this may no longer be true. Perhaps this void has unduly influenced our thinking.

If we look critically, at our repair facilities in a Field Workshop we must admit that we are a fair weather organization. Can you visualize an instrument technician collimating range finders with the rear door of the van open in 30° below weather with a good stiff breeze blowing. This makes a temperature/humidity controlled environment just a little difficult to maintain.

Let's look in on the radio section operating under the same weather conditions. All the technicians are in the vans but there is only room for one or two sets undergoing repairs in each van. Replacing the 3/4 tons with 2 1/2 ton vans would provide more working space, but is it justified in each brigade? Shelters would help, but they are expensive and have very short lives.

You might say "This is unfair. You are citing the worst possible conditions. Let's look at it under conditions where we are likely to find ourselves".

Fair enough. The CA(R) is likely to become involved in two types of operations; these are UN peace-keeping operations, and a general or limited war.

In our peace-keeping operations, it is standard procedure to run maintenance flights weekly or twice weekly. Our air transport resources are growing and we could increase the frequency of these flights if necessary.

When we begin a peace-keeping operation it is true that we sometimes operate under field conditions. But after a short time we find the RCEME people occupying reasonable working accommodation. In fact we convert our mobile facilities to static workshops. Egypt and Cyprus are good examples of this.

In a limited or a general war we will operate from some sort of base. Our brigade or brigades will be forward of the base and we will have our normal ground transport augmented by the aircraft of the transport helicopter platoons.

In effect, what I am saying is that our ability to transport fairly large items of equipment quickly over long distances has changed dramatically. We should take advantage of this ability and we should reduce our repair capability within the brigade in favour of more efficient semi-static installations to the rear, perhaps housed in large semi-trailers.

We must retain enough mobile test equipment and tradesmen to diagnose faults and to do minor repairs on both instruments and radios, but this represents a small portion of the resources now provided.

In peace-keeping operations we tailor our support according to the equipment held by the force. Why not send an initial supply of replacement radios and instruments with the force, and evacuate equipment casualties by maintenance flight for repair at base? We would have to buy more radios and more instruments but this is probably cheaper than buying more test equipment.

If there is any merit in this suggestion why restrict it to instruments and radios? Why

indeed? Our Specially Equipped Vehicles in the vehicle platoon give us the capability to do much more than a field workshop is normally required to do. I submit that we no longer require the emergency capability to overhaul assemblies and components and to manufacture parts within the brigade and that, perhaps, we no longer need to retain our small arms repair capability in the field workshop.

There is an additional bonus that accrues when we reduce our capability within the brigade and that is a reduction in the spare parts we carry.

Admittedly these suggestions are put forth without the benefit of any detailed knowledge of the form of our future field force and with no cost or manpower analysis to support them. They are made because our field workshops have grown with every addition of new equipment (as they must). I think it is time we tried to reverse this growth in the brigade. The only way we can do this is to eleminate some of our work by having it done in the rear.

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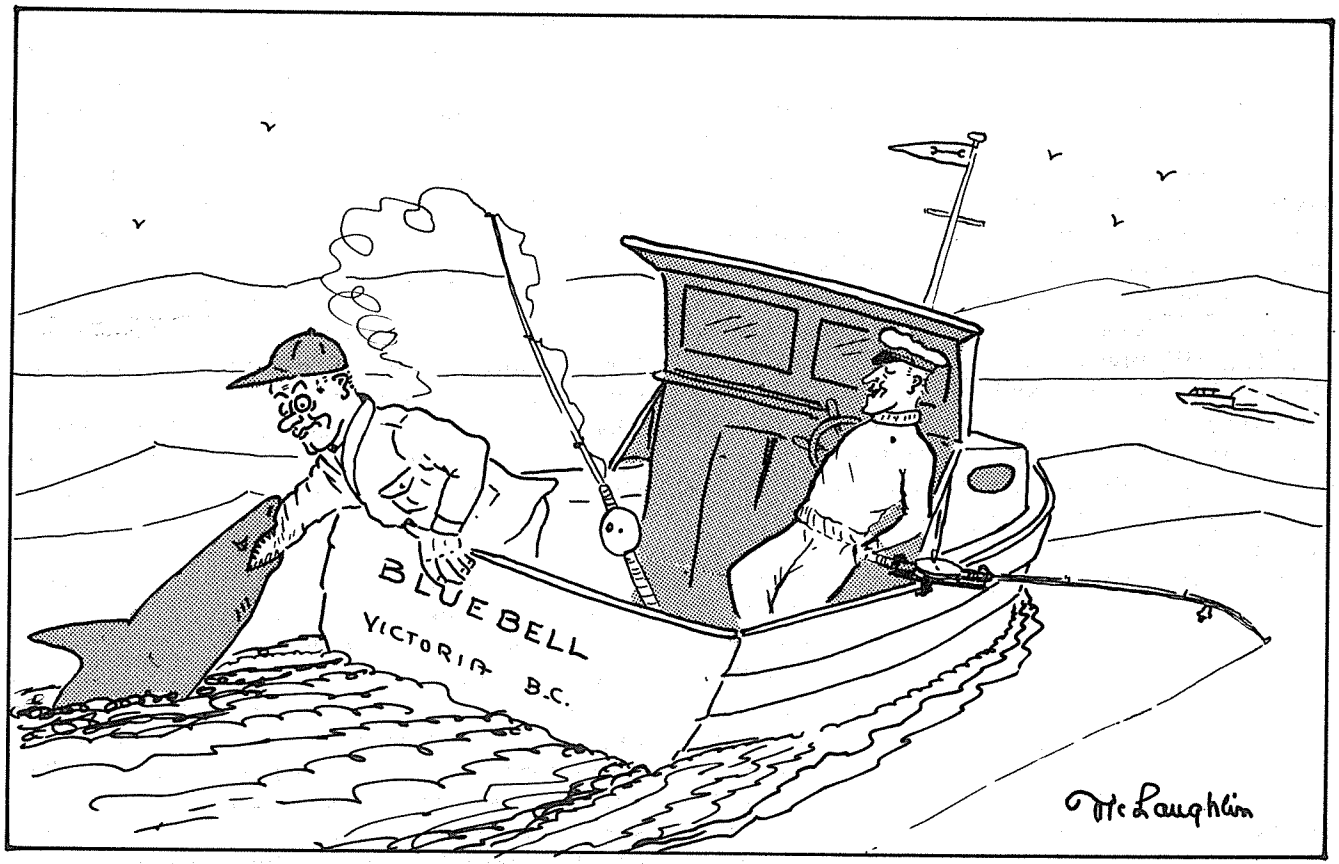
## ABOUT OUR ARTIST

Major HE McLaughlin is now retired and living in Victoria, BC. He is working as an instructor in vehicle mechanics with the Provincial Secondary School Correspondence Branch.

He writes that he manages "...to keep busy along with golfing, sailing and fishing. This is the life!" Most of us would agree. Incidentally, he does his 'instruction' at home by mail, so doesn't even have to get up in the morning.




TWO THINGS MAC FUDD ..... FIRST- A FISH IS GAFFED FROM THE OUTSIDE!
SECOND - THAT DOESN'T LOOK LIKE ANY SALMON TO ME!

# MILITARY WRITING

By Lt Col GW Bruce

Sir Ernest Gowers admonishes us in his book "Plain Words" where he says:

> "It is in this field of an official's duties, more than in any other, that good English can be defined simply as English which is readily understood by the reader. To be clear is to be efficient; to be obscure is to be inefficient. Your style of letter writing is to be judged not by literary conventions or grammatical niceties but whether it carries out efficiently the job you are paid to do."

He also quotes the words of the eighteenth century scientist, Pascal, who wrote:

> "I hope you will pardon me for writing such a long letter but I did not have the time to write a shorter one."

The first quote should be our immediate objective. The implications in the second our long range objective. Some letters, though not perfect in construction, accurately express the writer's views. However, more often than not poor construction reflects hazy thought and thus a poor letter. We should not say: "I will not sign a letter unless it is perfect", but we should say, "I will sign a letter which accurately states the problem and strives to state this problem with clarity, conciseness, simplicity and accuracy". When the day is crammed and busy we have all signed letters which are repitious, jumpy or literarily imperfect but which are accurate in their intent. We must not make a fetish out of producing perfect letters but we must strive for clear, concise, unmuddled ones. We all know of officers who have held up vital information simply because they didn't like the construction of certain sentences. If the meaning is clear, this is criminal. Now, of course, if it isn't clear then it is necessary to rework the letter. In the back of your diary it might be wise to enter this observation, and each year re-copy it into the next addition of your office life.

"No passion in the world
No love or hate
Is equal to the passion
To alter someone else's draft".

Before we discuss some ways of improving our writing, there are three things which are important but are often forgotten or ignored.

Be human. Canadian Army writing is, in the main, bone dry, lacks spark, drive and simple human interest. Does our writing have to be completely devoid of human traits? Surely not. There is a place for politeness and consideration of others. The most boorish thing to do is to consider everyone else devoid of common sense and ability. Don't take the parade square into your letters. There is little excuse for officiousness. We have all seen these phrases "Corrective measures will be taken at once", "Ensure that this won't happen again". And the answers. "This will no longer occur" - "This will be corrected at once". Stop - It will happen again because people are human and it often won't be corrected at once because it isn't physically possible. Observations on conditions in units have become dirty words not helpful comments. This is an insidious thing. Be human.

Secondly, your writing must be complete. Put yourself in the receiver's seat; surround yourself with his environment and then write what you have to say giving all the necessary information so he knows what you are talking about or want without having to write back to you.

Thirdly, be simple. When you buckle on your uniform don't let your air of distinction, or any wish to produce the well-turned phrase, or any attempt to display your vocabulary, or any desire to be safe by being misty in your thought, detract from probably the most important principle of official English. That principle is - use simple, clear English. For some reason as we leave childhood and school we also leave behind the simple word and take up the outworn phrase, the less precise longer word. Some graduate into the ranks of the many who have allowed their written expres-

sion to become so laden with unnecessary, pompous, empty and abstract words; so full of padding and circumlocution that they have lost the art of communicating ideas to others.

Here is an example of excellent, simple English written by a child of 10 in response to an invitation to write an essay on a bird and a beast. Note that the words are short, familiar and that there is no circumlocution. It is beautifully simple but very expressive. "The bird that I am going to write about is the owl. The owl cannot see at all by day and at night is as blind as a bat.

"I do not know much about the owl so I will go on to the beast which I am going to choose. It is a cow. The cow is a mammal. It has six sides - right, left and upper and below. At the back it has a tail on which swings a brush. With this it sends the flies away so that they do not fly into the milk. The head is for the purpose of growing horns and so that the mouth can be somewhere. The horns are to butt with and the mouth is to moo with. Under the cow hangs the milk. It is arranged for milking. When people milk, the milk comes and there is never an end to the supply. How the cow does it I have not yet realized but it makes more and more. The cow has a fine sense of smell; one can smell it far away. This is the reason for the fresh air in the country.

"The man cow is called an ox. It is not a mammal. The cow does not eat much but what it eats it eats twice, so that it gets enough. When it is hungry it moos, and when it says nothing it is because its inside is all filled up with grass."

There have been countless rules made as guides to the use of words and many hot written and verbal exchanges between the high authorities have ensued but out of it all the following three rules seem to express how best to convey our meaning without ambiguity and without giving unnecessary trouble to our readers:

a. Use no more words than are necessary to express your meaning for if you use more you are likely to obscure it and to tire your reader. In particular do not use superfluous adjectives and adverbs and do not use round-about phrases where single words will serve.

b. Use familiar words rather than far-fetched, for the familiar are more likely to be readily understood.

c. Use words with a precise meaning rather than those that are vague for they will obviously serve better to make your meaning clear; and in particular prefer concrete words to abstract for they are more likely to have a precise meaning.

The word "padding" is often used to signify unnecessary words. Most woolly phrases are mere padding which can be left out altogether or replaced by a single word. Words or phrases in this category which are very prevalent are:

"It is appreciated that,"
"It should be noted that", and
"In the event that".

The extra word(s) underlined in the following serve to weaken the phrase; temporary loan, adequate enough, often in the habit, cooperate together, penetrated into, pair of twins, unite together, consensus of opinion.

Strong words like "urgent, danger, crisis, disaster, fatal, grave, paramount" and "essential" lose their force if used too often. Reserve them for strong occasions and then let them stand on their own legs without adjectival, adverbial support. For example, do not say: "This is a matter of considerable urgency", say "This is urgent".

Writers quickly learn that a false intensity always creates the opposite effect. "Fierce" is a fierce word; "very fierce" is a tame phrase which demonstrates that the writer's command of language is so shaky that he must rely on weak intensives. "Devine" is a heavenly word but "too devine" is merely a debutante's way of describing a luncheon party.

Use the 'every-day', not the 'out-of-the-way', word. Here are some words we see a lot which could be replaced with more accurate ones:

"Feel" - This should not be used as a synonym for "think". Thinking is a rational process, feeling an intuitive one. Official decisions surely should not be

described as the production if intuition.

"Global" "Overall" - There is a place for these two words but they are often given jobs better performed by words like "comprehensive", "total", "world wide", "universal", "average", "general" and others. Don't say "overall average". "Average" alone is enough. Anymore is padding.

"Implement" - We are always using this in official correspondence. Why not "carry out" or "fulfil".

"Integrate" - Why must everything be integrated, which means to combine parts into a whole? The word is often used in preference to familiar words such as "order, organize" and "coordinate".

Use the concrete word rather than an abstract. Abstract words are those words separate from matter like "thought", whereas concrete words are those words which are things rather than qualities, like "brain". Some familiar abstracts, and I might say over-worked abstracts, are "situation, condition, position".

An example of an abstract is:
"The situation in regard to gold is causing alarm". What situation in what regard? Why alarm?

The sentences may mean several things to several people but if we use the concrete, we say: "Gold is scarce".

On an historic occasion it fell to a master of words to make a grave announcement. Sir Winston Churchill did not begin his broadcast on the 17 June 1940 "The position in regard to France is extremely serious". He began "The news from France is very bad". He did not end it "We have absolute confidence that eventually the situation will be restored". He ended "We are sure that in the end all will come right".

Now, of course, if you want to be cautious and hazy and vague, or if you don't want to go out on a limb and commit yourself, then you will find these abstract words useful. But then, of course, you won't be doing your job.

Keeping in mind the three rules, read through all your letters and subject them to a thorough scrutiny. Remember, be human, be complete and be simple; your letters will improve.

(The author is indebted to Sir Ernest Gowers (Plain Words), Sydney J Harris, Columnist (Ottawa Citizen), Royal Bank of Canada (Monthly news letter).

## RCEME TO THE RESCUE AND SHADES OF INKWELLS FOR THE PRESIDENT!

Yesterday the Queen Mother stopped over for the day. The car was a Lincoln '66 hardtop 'Courtesy Ford' which is kept at Bay Shore for VIP in $130 per day suite. We put a bumper bracket and staff for the Royal Standard on it in the workshop.

At 0930 I received a note "Mission successful from Airport to Hotel Vancouver. She now wants a convertible. Can you put the staff on here? No other info did I have. The note was 3rd hand via telephone from Major Crawford who was on the spot at the hotel. I called Ssgt Bodine, gave him the message, and as we had a spare bumper hook-up for a Chev and a Cady (standby cars as alternate for airports in case of fog, etc, at Vanc) he took Mat the welder with wrenches, 4 lb hammer, bar of iron as an anvil plus the brackets and away to Hotel Vancouver.

Major Crawford phoned Ford top brass to try for a Lincoln convertible. Every one down the line away except clerk in District Division Office. He did not know if Ford had an agreement with the Army but Doug Crawford impressed him enough that he acted. He phoned all the dealers, no '66 Lincoln convertibles in stock. Found a '66 Red Merc. Not suitable. Phoned used car lots and Black's had a '65 low mileage, silver grey on the lot. It was washed gassed, etc, and delivered from Burnaby to the hotel in 40 minutes.

Premier Bennett's car, a '65 Lincoln, was in front of the Hotel behind the '66 hardtop. Taking a chance using the iron as an anvil Mat beat the Chev bracket to fit the Premier's car and when the convertible drove up 12 minutes before the deadline they slapped it on. Perfect fit.

While Sgt Watson is driving around the block being checked out by the RCMP Doug Crawford is sitting in the back seat with Kleenex doing a final rub. About 8 minutes before deadline, mission accomplished. Both Bodine and Mat were briefly swept by the TV cameras and Bodine's comments were "good thing I just had a hair cut".

-JE Brewster Capt

# Technical Notes

## AIR BOX HEATER FUEL SYSTEM (M113A1 DIESEL FAMILY, 6V53)

Editor's Note:

Change 2 to TM 9-2300-224-20/2 covering the operation and repair of the air box heater fuel system will be available in approximately 3 months.

The information below will serve as an interim instruction.

### Description

The hand pump has a metal plunger with two sealing rings and a spring-loaded needle valve which closes as shown, with the plunger handle latched at the bottom.

The accumulator is fabricated from a composition-rubber tube installed as shown within a steel cylinder. It should be precharged to 35 psig preferably with dry nitrogen. Notice that the gauge does not monitor nitrogen pressure directly.

The solenoid valve and spray nozzle are actuated by the air box heater switch along with the heater ignition coil. Best atomizing of fuel occurs with the heater fuel system at 55 psig or higher (mid-yellow range on gauge).

### Checkout and Maintenance of Engine Air Box Heater

The air box heater is not required above 40°F and needs no maintenance when not being used. When temperatures below 40 are anticipated the following checkout and maintenance must be performed as required.

### Checkout

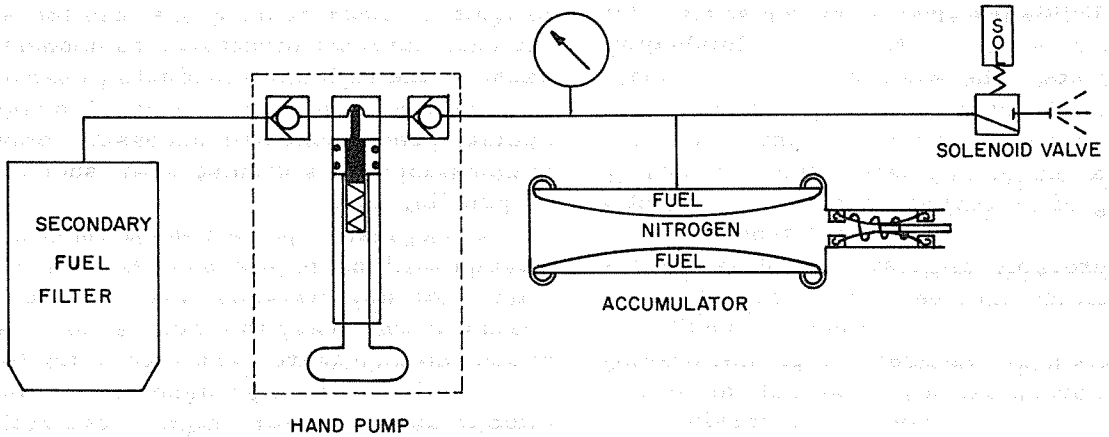
Discharge accumulator slowly until accumulator pressure gauge needle hits peg in red zone (zero hydraulic pressure).

Check nitrogen pressure at end of accumulator and recharge nitrogen side of accumulator to pre-charge mark on gauge if required.

Check condition of main fuel system by operating engine at 1200 rpm with hand pump handle in OUT position. Accumulator gauge needle must be in yellow zone after 1/2 minute of running.

With engine idling, cycle heater switch 1 second on and 2 seconds off. When heater fires, a cloud of black smoke will be emitted from the exhaust outlet. If heater fires 4 times in succession, the system is operating properly. The heater may also be tested by cycling heater switch 1 second on and 2 seconds off while cranking the engine with engine shutdown control pulled out. Smoke at the exhaust will be less in quantity, but discernible.

As optional method, pull engine shutdown control out; remove air cleaner container with element; remove left front air box hand hole cover and cycle heater switch as above without cranking engine. Existence of flame may be observed through hand hole opening.



Maintenance

If heater fails to fire, discharge accumulator and remove the casting from the front of the engine which contains the fuel nozzle and ignitor points without breaking or disconnecting hydraulic lines.

Clean ignitor points with a wire brush and adjust gap to .080 in.

Check ignitor coil and points by grounding casting to engine and impressing 10 volts on the air box heater electrical system. A continuous spark must appear across the points.

CAUTION

Do not operate coil unless properly grounded and with a spark gap in the system.

The solenoid valve must open at 10 volts and not leak at 100 psi pressure at the inlet when the current is off.

Disassemble nozzle and perform the following operations:

a Clean nozzle orifice with .009 inch maximum diameter wire.

b Clean nozzle filter with solvent.

c Reassemble nozzle and filter.

Reassemble complete air box heater and check out as outlined above.

---

CARRIER, PERSONNEL, FULL-TRACKED: M113A1-M577A1 AND M548A1

Any attempt by welders to weld magnesium with 'stick' or coated electrode welding, using steel, brass, or aluminum electrodes will result in flash fires and create a safety hazard to personnel.

If repairs have to be made to a damaged vehicle, the first thing to do is to determine the base material to be repaired. If it is made of metal and if, when you pick it up, it seems rather light for its size, it's probable aluminum or magnesium. If you can't pick it up because it's attached or too big you can determine the difference after scraping some paint off the damaged part. Steel has a bluish-gray metallic luster whereas aluminum and magnesium have a silvery white appearance.

The difference between aluminum and magnesium may be quickly determined by shaving or peeling off a corner or edge of the metal with a pen knife. If the metal tends to flake off, it is probably magnesium. If it seems relatively gummy and peels off in curled chips, it is more than likely aluminum. If additional determination is required, place the shaving on cement or a steel block and apply an oxyacetylene torch to the shaving. Magnesium will readily ignite and burn with an intense brilliant flame and emit white billowy smoke as the torch is held on the molten metal.

If the part is made of magnesium and needs to be repaired, weld it by the "TIG", Tungsten-Inert-Gas, Arc Welding Process. Instructions for this welding process are outlined in TM9-237, dated October 1958, paragraph 160. Do not attempt to weld magnesium with MIG Welding Set.

Magnesium surfaces to be welded must be thoroughly cleaned prior to welding as outlined in TM9-237, paragraph 160.

The possibility of fire caused by welding magnesium metal is very remote. Magnesium does not burn while it is in the solid state. It has to be melted before it can ignite. Its melting point is about 1000°F. It would be difficult to ignite a piece of magnesium the size or thickness of most structural components, because of the high heat-conducting characteristics and the temperature required for ignition. Special precautions are necessary only when magnesium is in a divided form such as chips or grinding dust.

If magnesium parts need to be cut, do not attempt to flame or torch cut them by oxyacetylene, or any other thermal method. Magnesium is very easy to machine, saw, shear, punch, etc, so there is no need to try to flame cut it. Flame cutting magnesium is an invitation to danger unless properly controlled.

If repairs involve machining, keep in mind that magnesium is the most easily machined of all metals. Also, it can be machined at

medium speeds with greater feeds than other metals. Caution must be taken not to overheat the metal.

During machining take as heavy a cut as possible. Finish cuts are frequently not necessary to obtain a good surface. A single 'roughing' cut to the finished dimension is usually possible. Avoid cuts that produce fine shavings or chips. The finer the chip, the greater the possibility of fire.

Never allow a tool to dwell on the magnesium work piece, when the lathe is stopped; back off the work piece immediately. A stationary thin chip adjacent to a hot tool may readily ignite. Also, if the feed is stopped without the lathe being stopped, the cutter should be backed off the work piece. This prevents heating caused by friction of the tool rubbing on the work piece.

Cutting fluids should not be necessary for low production type of machining. Their purpose is not to lubricate, but rather to cool. If a coolant must be used, it should be a mineral oil base.

If bending or forming magnesium is required, most relatively mild bending or forming can be done at room temperature. If severe bending or forming is required, magnesium should be heated, to avoid cracking. The temperature needed depends on the severity of the bending or forming to be done; however, temperatures should not exceed 650°F. For moderate bending or forming, a temperature of approximately 350°F may be sufficient to prevent magnesium from cracking.

Good housekeeping should be practiced when machining magnesium. Do not allow large piles of chips to accumulate on machines or on the floor. Store chips in steel drums and keep the drums covered. Avoid letting chips get wet in a drum or in a pile, as they present a fire hazard.

Dispose of magnesium chips by burning them in an open area away from buildings, vehicles, personnel, etc. If chips are wet, dump them on a loose brick surface, rocks, or freely drained cement area, and allow them to dry out. Cover a shallow layer of chips with refuse, dry leaves, etc, and light the refuse. This will ignite the chips and reduce the possibility of a large flash fire.

Proper precautions should be taken when grinding magnesium. Operators should not permit dust to collect on their coveralls or aprons. Grinding should not be performed near any source of fire or sparks, or near a welding operation. Grinding wheels used to grind magnesium should not be used to grind steel. Sparks caused by steel grinding can ignite the magnesium dust accumulated around and on the grinder and cause a flash fire.

If, in welding, machining, or grinding magnesium, a fire does occur, do not attempt to extinguish it with conventional type extinguishers such as water spray, $CO_2$, carbon tetrachloride, etc. Extinguish the fire with dry sand, dry powdered soapstone or dry cast-iron chips. The preferred extinguishing agents for magnesium fires are graphite-base powders.

## SAFETY ITEM

As the result of a suggestion award (RCEME, of course) you can change SMP truck tires safely.

An EME Manual (Misc Eqpt O 321) has been published showing the many uses of this safety feature.

To make one is a simple matter and it may prevent a serious accident in your shop. Write LMM MATCOM, Rockcliffe, Ont, for a print of the drawing DEME 800152.

## SUGGESTIONS RECEIVED

These files were received in LMM during April to July. The publication of the particulars here does not in any way imply their acceptance.

| | |
|---|---|
| Cfn JA Wemyss<br>Camp Petawawa | Inclusion of 27 oz propane torch in instrument shop |
| Ssgt JI Freeman<br>2 Coy | Tap to repair the thread in return spring tube |
| Capt HJ Hellard<br>Camp Borden | Replacement of M62 with a standard comm model |
| Mr D McIntosh<br>27 COD W/B | Engine stand for M113A1 in Field workshops |
| Mr H Goer<br>2 Coy | Method of reinforcing engine hood of older model 2 1/2 ton GMC SMP |

## FROM CLERK TO CONTROL OFFICER? WHY NOT?

By Sgt JD Dunsmore

Q. What is the basic function of a workshop control officer?

A. To control the work flow in and out of the workshop extracting pertinent data from the workload and forwarding this data to DLMM.

Q. What trade is the control officer?

A. If not a subaltern, he is usually a Mr Veh Tech or Mr Wpns Techn.

Q. What training or experience did he have for the job?

A. Possibly a management course at the RCEME School and/or experience as a section supervisor within his own trade.

Q. Who compiles the management data, processes the time accounting documents etc, and maintains the records for the control officer?

A. The control clerk.

Q. Is the control clerk trained for this function?

A. Not formally, just from experience on the job.

Q. Can the control clerk perform all the functions of the control officer?

A. Yes. With formal management training he would be better qualified by reason of experience.

Q. Why not advance senior clerks to control officer positions if they have had years of experience on the job and are familiar with all the functions?

A. Yes. WHY NOT?

The RCEME Corps, comprising various technical trades, has all but ignored the clerks. It is perhaps not a very technical trade but a very important one to the efficient operation of the corps, and can be utilized to a greater extent. With all the emphasis placed on management over the past years it is surprising that so little notice has been given to the control office clerk. Under the present organization a RCEME clerk:

IS NOT given any formal instruction on RCEME control procedures.

IS responsible to the control officer for the compilation of all accounting data emanating from the workshop. (Due to lack of formal instruction many are unaware of errors being submitted).

IS NOT employed on administration when posted to a control office and therefore loses touch with his official trade (usually for many years). With the centralization of administration his role will swing more and more toward control accounting.

IS required to work closely with the control officer and often replaces him during absences.

HAS all the experience and basic knowledge to more easily absorb the management training which at present is unavailable to him.

CAN, with a management course, become an efficient control officer without further training due to years of experience as an understudy.

COULD be the medium by which management techniques can get off the ground and into operation.

Is it not feasible to assume that a senior NCO who has worked for years with time accounting procedures can go one step further and become an efficient control officer? Does it not make sense that this NCO would have more experience and be better prepared for such a job than a technician who has spent many years as an artisan with limited knowledge of procedures? Wouldn't this NCO also be more qualified than a lieutenant fresh from school? But, do we use this man to his full capacity? No, we put him into a position where he loses touch with his formal trade, insist that he learn a new one (workshop accounting) by himself, and when he has mastered this and is ready to progress, we ignore him. A group three corporal clerk, having passed a senior NCO course, has obtained all the qualifications placed in his path and we offer no further incentive for advancement. Rank now comes automatically with time so he becomes a disinterested spect-

ator with a monotonous future ahead of him. It is no wonder that so little interest in management controls are taken. But, given the opportunity for further advancement in his trade, and a concrete part in the workshop production, and the clerk HAS an incentive.

We would never consider training a mechanic and, after years of experience, when he is ready to advance to a technologist, put a clerk in his stead. Then why move a mechanic into the position in a clerk's career when he is at the peak of his knowledge and usefulness. At the same time is it right to spend years training a man to be a technologist and then put him into a position where this training can only be used to a very limited degree?

The following progress chart could be used in the training and upgrading of RCEME clerks:

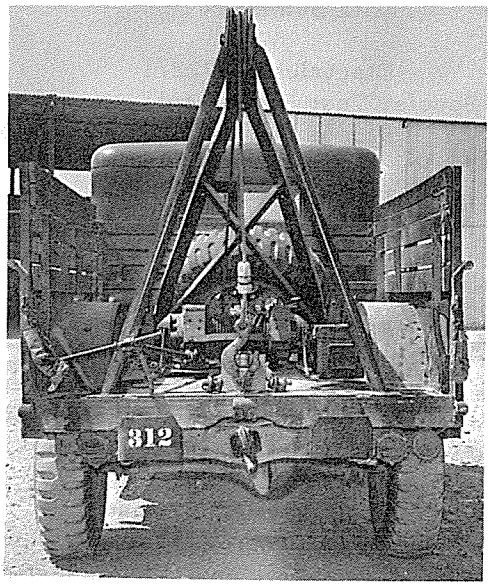
CONTROL OFFICER
(WO 1 or WO 2)
Clk RCEME Gp 4
(Ssgt)
Management Course
Clk Adm Gp 3
(Sgt - Cpl - Cfn)
RCEME Accounting Course
Clk Adm Gp 2
(Cfn)
Clk Adm Gp 1
(Cfn)

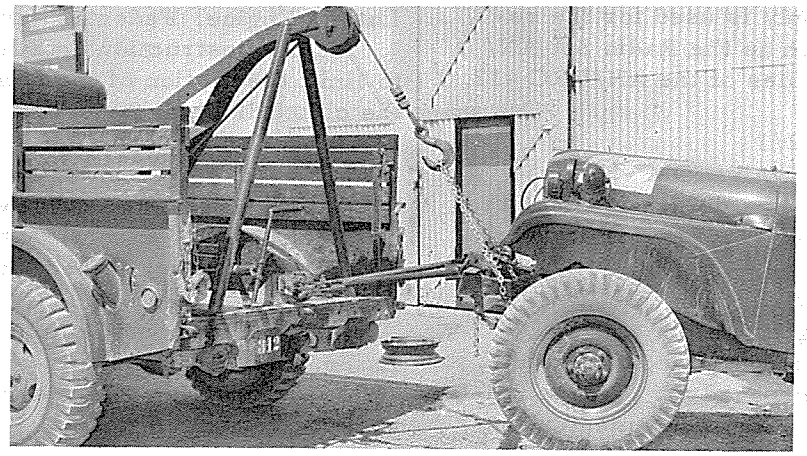
## NEW RECOVERY VEHICLE IN CYPRUS

The following paragraph and the photographs below have been extracted from a DO letter from Capt MG Masuda OIC RCEME Detachment in Cyprus to Lt Col Sherren.

"Up to the present we have been using a 3/4 ton with tow bar for recovery. This arrangement was unsatisfactory so we improvised a boom and hand-operated winch on the back of a 3/4 ton truck. We are extremely proud of the results and are enclosing a picture of it. Incidentally, the whole arrangement is mounted on a steel plate which is bolted to the frame and thus can easily be removed".

This appears to be a very useful piece of equipment for units with light vehicles. Perhaps you have a similar idea. May we have your comments about such a vehicle. Who knows, a new wrecker for the Canadian Forces may have been born.



# EME MANUAL ISSUES

Electrical D 667 Instr 6
Transmitter, Radio, 5KW
Application of three modifications to enable the transmitter to function in the SSB mode of operation.

Electrical I 250
Receiver Transmitter RT 505/PRC
Data Summary

Electrical O 617 Instr 4
Radar Set, AN/MPQ 501
Inserting a dropping resistor in the input motor power line.

Electrical Z 530/2
Test Set, A and B Harness, W/EQPT
Data Summary

Electrical Z 722/1
Special Test Equipment
For use with Radar set AN/MPQ-501.

Electrical I 164
Radio Set CPRC- 26
Supersedes issue 3 of pages 9 and 10.

Electrical I 424
Receiver Transmitter RT - 524/VRC
Interim instruction published to provide a consolidated source of information normally scattered through several TM's

Electrical K 627 Instr 1
Handset, H- 5003/PRC
This issue amends handset diagram.

Electrical X 420
Power Supply, Semiconductor
This power supply is used for the repair of equipment such as the Radio Set AN/PRC- 25 and the modules of the AN/VRC -12.

Electrical Y 312/1
Calibrator Set, Radiac AN/UDM -501 (v)
This equipment is a device to check the calibration accuracy of various radiacmeters.

Electrical Y 650/2
Frequency Measuring Set
This is a general purpose, solid state, counter type equipment used for precise frequency time and related measurements.

Instruments A 009 Instr 14
Redesignation of Instructions

Management B 110
Maintenance Responsibilities - RCEME Servicing Sections
Details responsibility for the maintenance of transport pool vehicles.

Management H 551
Condemnation of Stores and Equipment
RCEME repair responsibility.

Management L 105
Dealers Estimate and Work Authorization order (DEWAO)
Details the procedures to be applied when arranging vehicle repairs by a DEWAO.

Management K 010
Land Materiel Maintenance Management procedures
Page 0.1 and issue 7 of pages 1 and 2 and pages 1 and 2 of annex G.

Miscellaneous Equipment O 320
Mounter and Demounter, PN Tire, Stationary
This instruction details the manufacture of an anti-rotating wheel adapter for the Mounter and Demounter PN Tire, Stationary.

Miscellaneous Equipment R 100
Lathe, Engine, Pedestal, Solid Bed 16 x 30, McDougall Model
This precision screw-cutting engine lathe has been designed and built especially for the armed forces.

Miscellaneous Equipment R 107 Instr 1
Lathe, Engine, Pedestal (as above)
This instruction details a modification to limit the motion of the armature plate when the clutch is disengaged and specifies the proper oil for the disc clutch.

Miscellaneous Equipment R 107 Instr 2
Lathe, Engine, Pedestal (as above)
Modification to feed lever.

Miscellaneous Equipment R 107 Instr 3
Lathe, Engine, Pedestal (as above)
Modification to forward and reverse switch.

Vehicles A 006 Instr 16
Carrier, Full Tracked, Armoured M113A1 and M577A1
PRS and SRT.

Vehicles A 110
Provisional Condemnation Policy
Amendment Page '0'.

Vehicles A 777 Instr 4
Trucks, Standard Military Pattern
Installation of standard commercial turn signals. (Supersedes issue 2 and E 037 Instr 31 issue 2).

Vehicles D 119 Instr 31
Truck, Panel, 3/4 Ton, 4 x 4 M152
Installation of heavier rear springs.

Vehicles L 103 Instr 3
Carrier, Full Tracked, Armoured M113A1 and M 577A1
Idler and road wheel oil leaks.

Vehicles L 107 Instr 2
Carrier, Full Tracked, Armoured M113A1 and M577A1
Alternator drive pulley lubrication.

Vehicles L 109 Instr 4
Carrier, Full Tracked, Armoured M113A1 and M577A1
Crew servicing pamphlet amendment.

Vehicles N 027 Instr 34
Car, Armoured, Ferret, MK 1
Details two modifications to the suspension link brackets.

Vehicles N 029 Instr 4
Car, Armoured, Ferret, MK 1
Bracket, stowage, Rocket (LAW) M-72.

Vehicles X 289 Instr 1
GM Diesel Engine - Series 53
Torque values.

Vehicles Z 060 Instr 14
Bus, Motor, 60 Passenger, SC
Amendment page '0'.

Vehicles Z 180 Instr 4
Truck, Fire - Fighting, Pumper, Class 'A'
Amendment page '0'.

Vehicles Z 320 Instr 1
Truck, Cargo, 3/4 Ton, 4 x 4, M37, CDN
Amendment page '0'.

Vehicles H 613 Instr 2
Bus, Motor, 40 Passenger
Lubricant for IHC model RD 450 engines.

Vehicles N 029 Instr 11
Car, Armoured, Ferret, MK 1
Modification to the windscreen wiper motor, cable connector pins.

Vehicles Z 270 Instr 1
Trailer, Cargo, 10 Ton, 4 WH, Aircraft Unloading
Data Summary.

Weapons B 570
Projector, Pyrotechnic, Hand, C1
Data Summary

Weapons C 829 Instr 6
Rifle, 7.62MM, FN, CIA 1
Loose pistol grip assembly

Weapons E 119 Instr 3
Rifle, Automatic, 7.62MM, FN, C2A1
Loose pistol grip assembly

Weapons F 110
Machine Gun CAL .50 L6A1
Data Summary

Weapons G 157 Instr 1
Gun, 84 MM, Inf ATK, L14A1
Modification to the screwdriver 5/6 mm

Weapons F 112
Machine Gun, Cal .50, L6A1
This instruction describes the machine gun, cal .50 L6A1 and details the operation of its mechanism.

DID YOU KNOW?

UNITED NATIONS Canada has participated in every peace-keeping operation of the UN (Kashmir, Korea, Egypt, Lebanon, The Congo, New Guinea, Yemen, Cyprus). More than 2,100 Canadian servicemen serve overseas with the UN. It is estimated that more than 70,000 have served under the UN flag, dampening regional and local conflicts to prevent major war. -The Beaver

# THE M113A1 FITTERS VEHICLE

(This interesting description of an M113 adaption appeared in The Craftsman, written by Major PDF Cleaver, REME. -Ed)

When the Australian Government took the decision to purchase certain members of the M113A1 family of tracked carriers for its Military Forces, no vehicle existed for a repair role. As a result, the FMC Corporation of America, the vehicle manufacturers, had to undertake a development project to modify the personnel carriers for the RAEME role. The vehicle developed was designated the 'Carrier, Forward Repair, Full Tracked M113A1, Fitters'.

The modified vehicle includes a HIAB hydraulic crane mounted on the left hand side of the vehicle, and a large cargo hatch, which opens to the right of the vehicle. Further development of the vehicle was necessary in Australia to improve the water stability, which had been upset by the installation of the crane, and to fit the vehicle out for the stowage of tools, welding equipment, and other items required for repair purposes.

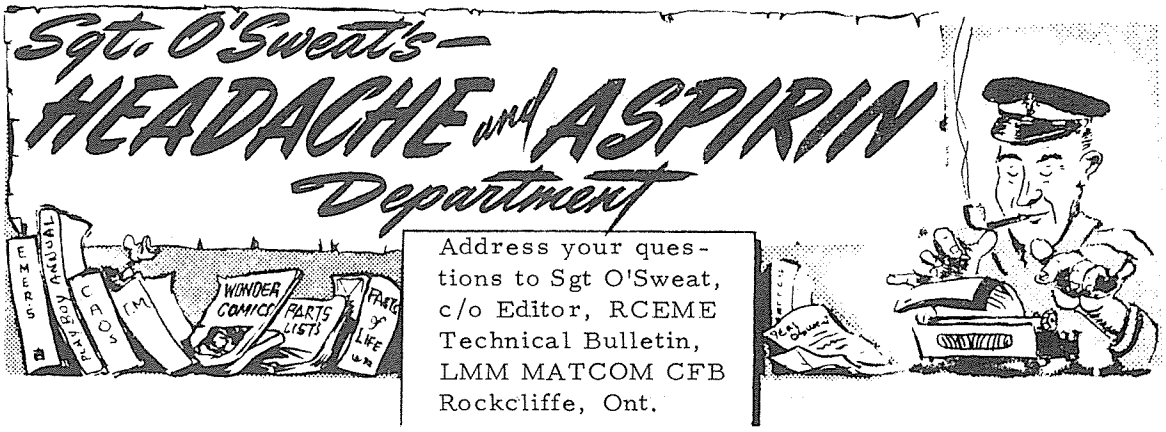
In common with other members of the M113A1 family, the Fitters vehicle is powered by a GMC 215 HP 6V-53 diesel engine, which is connected to the final drives through an Allison automatic transmission. Hydraulic power is used for raising the rear ramp in addition to that necessary for operating the crane. A total all up weight of about 10.5 tons has been achieved for the vehicle by the use of aluminum alloy armour, enabling the vehicle to be air dropped, should the need arise. The vehicle can be prepared for water operation in about five minutes by erecting the front trim vane, and fitting a small wading screen around the engine air inlet. Infra-red night driving devices are provided, and a 0.5 inch machine gun is carried for defence. This has to be ground mounted when the cargo hatch is opened.

The Fitters vehicle carries a crew of three, and will provide close RAEME support to APC and field squadrons, cavalry and armoured regiments, and will also be deployed with field workshops. To cover all these applications, a wide range of major assemblies will have to be carried, and work is in hand on the development of a universal pallet, which can hold any major assembly, and can also be slung beneath a helicopter.

Reports now being received from Vietnam indicate that the M113A1 carriers at present in use in that country (with Australian Forces) have given excellent service, and are superior to the earlier petrol engined vehicles operated by the American Forces. Hence, with such a vehicle, RAEME can confidently look forward to the services of a reliable and versatile repair vehicle for future operations.

-The Craftsman

*'No, I'm not electronic, I'm mechanical!'*


Sgt. O'Sweat's—
HEADACHE and ASPIRIN
Department
WONDER COMICS
PARTS LISTS
PARTS of LIFE
Address your questions to Sgt O'Sweat, c/o Editor, RCEME Technical Bulletin, LMM MATCOM CFB Rockcliffe, Ont.

Dear Sgt O'Sweat

I am submitting an EFR on my problem but perhaps you can help with an interim suggestion.

New quadrant arms have been supplied with the modification kits which converted our tanks to Mark 11. The plunger and lever which locks the handle range screw at a predetermined setting breaks off at the plunger.

This is poorly designed from a human relations point of view. Three different directional forces must be applied simultaneously to disengage the plunger. These movements are too complex for an already very bust gunner and besides causing delays in engaging the target result in this failure.

Either a redesign of the plunger and lever to simplify directional disengagement, or replacement with a plunger and detent ball working in a hardened recess insert will be necessary to make this item operationally acceptable.

W. G. S.
Europe

Dear W. G. S.

The Canadian design authority is now working on your problem as a result of your EFR. They have produced an interim fix under authority of EFI CV101417 dated 16 Jun 66 but it will be some time before the parent design agency design a permanent fix.

Thank you for writing me as well as submitting an EFR because this gives us the opportunity of informing other maintenance organizations.

The design people say as follows: This failure seems to be caused by a combination of poor human engineering and in some cases, poor workmanship. The UK design authority has been asked for a design improvement. In the interim, it is recommended that if the lever breaks off it be replaced by 3/16 in steel rod bent as shown and silver soldered to the plunger.

Sgt O'Sweat

Dear Sgt O'Sweat;

A surprising number of tradesmen argue that trailer-mounted generators are a one-piece equipment and that all repairs to the generator should be charged against the CAR number of the trailer. I maintain that each is a separately coded item and repair costs should be recorded on separate 2149s.

Could you clarify this for the benefit of all.

(JD Dunsmore) Sgt
217 Workshop

Dear Sgt Dunsmore

You are right. Repairs to a trailer should be recorded on one CAFC 2149 and repairs to the equipment mounted in the trailer should be recorded on a separate 2149. This point will be included in the next rewrite of Management K 010.

Sgt O'Sweat

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Old-time plumber: "When I was an apprentice we used to lay the first two lengths of pipe then the boss would turn on the water, and we'd have to stay ahead of it."

RCEME in 1984

# A Look Into The Future

By Major RDL Connell

I enlisted in the Royal Canadian Marines in 1979 and up until now I have enjoyed my tour. You see my re-engagement comes up this year but I'm a bit worried about all this talk of integration. They're talking about integrating THE Marines with the Armed Forces of other nations to become a World Police Force, in order to enforce the total ban on nuclear weapons. This integration just wouldn't work. Some of the nations actually have a complete separate force for air forces and ground forces and sea forces. Can you imagine trying to integrate with a system as silly as that. Let me tell you about our system and you'll see what I mean.

I am a Private, Electrical Technician Group 3M in the Logistics Branch. We look after all the radio, radar and electrical equipment in all the aircraft, ships, vehicles or other equipment of the Royal Canadian Marines. I started with the Marines in 1979 and was offered the choice of Logistics or Operations.

## TRAINING

After my basic training I took a basic electronics course in a school in Quebec. In this school courses are programed and there are no instructors as such. At the beginning of this phase of training, a test is taken to determine the level of training previously achieved and the man's learning rate. The results are fed to a computer which provides the student with a linear program fitted to his background and learning ability. This then eliminates the complications of branch programing. All lessons are presented by inserting this set of cards one at a time into an instructional machine and reveiving instruction via taped TV. The cards also direct students to laboratories where circuits are set up to provide a practical phase. The rate of advance is decided from the initial test and students may begin anytime. The program used for basic electronics is not related to any equipment used by the Marines. No equipment courses will be taught until group 4 level.

Next is a course related to service. This is a short three week course I attended after the basic electronics; it related service problems to maintenance in the field. Some of the instruction was by means of an instructor actually talking to students. The instructor kept referring to the time when he was a 'Reemy craftsman' (whatever that was) and they didn't have the card system to fix equipment. Fancy having to figure out what the fault was yourself, just from the sysptoms instead of getting a card from the computer. One would have to know how each circuit worked in every equipment instead of just the block diagram. Now the periodic inspection of equipment (electronically) is fed to the computer and depreciation rates of all the integrated circuits calculated. The computer then forecasts when the equipment will quit, so these circuits are replaced before they fail. The cards from the computer describe the part to be replaced, the directions for replacement and adjustment, and a diagram of the area concerned. Either symtoms or requests for components may be fed into the computer and the computer automatically orders the part. The tradesman is not interested in a forecast delivery date as will be explained later under "The Logistic System".

When I was posted to a unit, my training there also consisted of training by taped TV. All units did most of their individual training this way so when any tapes arrived, I was automatically programed into their instructional machine. I usually was involved in this training about two half days per week. At the beginning of each phase I again took a test to determine my retention of past knowledge and the present rate of learning. This determined the level and rate of progress of the program. Both the technical and management series covered theory and practice. Another series, which is designed to keep the older technicians (like me) up to date, is never ending. This series is also continually changing in order to stay up to date. The results of this training has a direct bearing on the amount of trades pay we receive.

The advanced courses for group 4 personnel include the complete circuits of our computers. Although a lot of computer problems can be solved by the use of another computer

some circuit tracing is still necessary. Only group 4 master technicians are used for this. The group 4 technicians who are qualified technologists also get involved in the production of the card system for diagnosing faults on equipment.

## THE LOGISTICS SYSTEM

The old system of specialist organizations to supply spare parts, repair, provide transportation and all the other logistics functions has disappeared. We only have two organizations now. Operations and Logistics, and a need to combine these two is on the horizon. Now that the computer does all the routine work the Logistics organization is run only by graduates in Systems Engineering. The old system of chain of command with its principle of unity of command has also disappeared. You see, when the horizontal liaison at various levels becomes 99 percent of the task then the system must be organized on a network basis.

The factors fed into the computers are the brigadier's tasks and the amount of equipment on charge to each unit and in reserve. Information on the routine inspection of equipments or damage from accident or enemy action is fed in by unit personnel. The computer then determines on a continuous basis the proper distribution of available equipment in units or from repaired or reserve sources. As it is virtually impossible to know all the facts about all the variables, the computer assesses the input of facts, and bases its output on probability. On the receipt of logistics information on rates of wear or damage, the computer loads each man in the workshop with one task at a time. Not more than one card at a time is issued as the system requires the capability of altering the priority of work up until the time the task is begun.

The first line battalions have seven mechanical technicians and four electrical technicians. I heard that there used to as many as 20 repair personnel at first line back in 1975 but test equipment became so expensive that we could only afford to put one in each workshop. The workshop has 52 personnel in it and used to have, I think, as many as 160. There computers have had something to do with it but I think it is because they are now using much more reliable components. These were developed for the space programs of the 70s and they just don't quit.

The computer also allocates resources of personnel, based on tasks, casualties and reserves. You see, supply of personnel is just another logistics problem.

## THE MECHANICAL TECHNICIAN TRADE

The mechanical technician repairs all types of mechanical equipment and has a background knowledge of the electrical trade. The first line inspections are completed in seconds with built-in test facilities, to minimize down time of equipment.

Here is the system for vehicles. Each part of the vehicle has a slightly different composition metal. The inspection consists mainly in taking a 1-ounce sample of oil and sending it to the diagnostic technician at the workshop. Here the sample is chemically and physically analyzed and the results fed into the computer. The computer then determines the wear rate of every moving part and automatically orders new workshop, orders the unit to forward the vehicle at this time and may, if the equipment availability for the current task is insufficient, order a replacement vehicle to arrive at the unit before the vehicle leaves for the workshop. The computer may also direct the technician to reduce his standards in order to meet an operational commitment. It will then BF the remaining repairs for a later date when the emergency is over. The technician then must accept the discipline of the repair cards and not rely completely on his past experience as to how to repair or adjust the part.

The actual time to repair is reported to the computer and this figure adjusts the future loading for this type of job and is also a measure of efficiency of the individual performing the task. The standard repair times thus established are not released to the worker. The backlog of work may result in a reallocation of personnel to the workshop.

## THE ELECTRICAL (ELECTRONIC) TRADE

In the electrical trade the procedures are similar. Here too, a background of the mechanical trade is essential. Most circuits consist of integrated circuitry blocks (3/4 inch cubes) which contain 100-200 components. These are throw away items. The usual life of these is one year without fault. The inspection

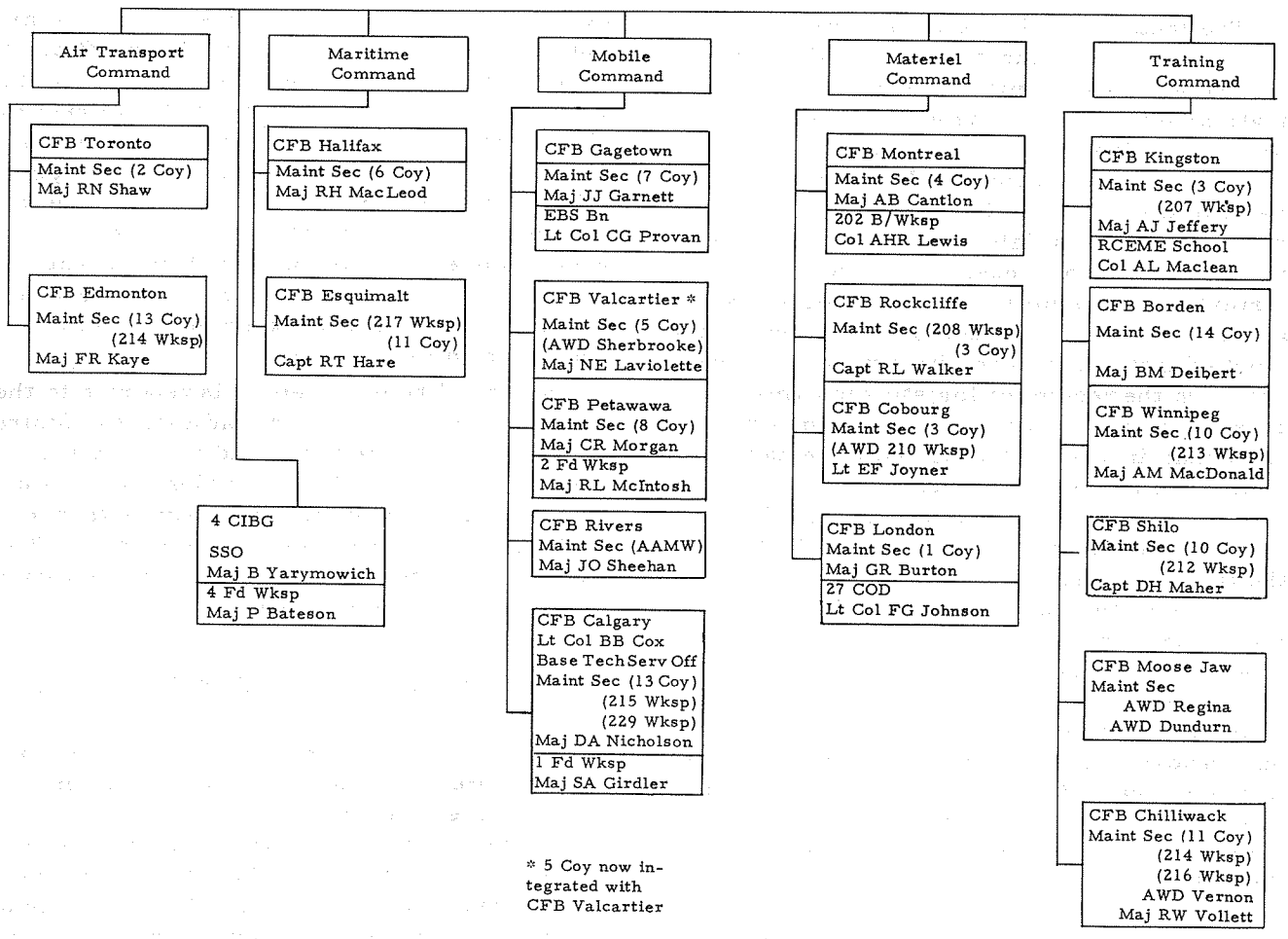
takes 3 seconds per set and the electrical technician feeds the information to the computer which in turn okeys the set or orders a new one to arrive prior to the end of the useful life of the set inspected.

Repairs at the workshop consist of replacement of blocks for radar sets, long range radios, TV cameras and aircraft stabilization systems. Workshops also have the responsibility of repairing computers. As these are a very high priority, most circuits are duplicated and periodic inspections will reveal that the set has switched to the alternate circuit and the original now requires repair. Most repairs are therefore completed while the set is still in use.

## MY FUTURE

I am presently with the workshop with 5 Brigade on a police action in Osmolia. I've been promised a promotion and a tour on board ship that I've asked for on my last three biannual confidential reports. I've had a good time in the Marines but what's going to happen to my seniority if we integrate? It's the unknown factors which bother me most. I think I'll enquire as to what's available on civvy street and just see what they offer. Still----there's that re-engagement bonus that they brought out in 1982--------?

RCEME OFFICERS & ELEMENTS in CF BASES



Chief of Defence
Staff
Gen JV Allard

CANADIAN FORCES HEADQUARTERS

- Vice Chief of Defence Staff — A/M FR Sharpe
- Chief of Personnel — A/M EM Reyno
- Chief of Technical Services — Lt Gen LGC Lilley
- Comptroller General — V/Adm RL Hennessy

COMMANDS and BASES

**Air Defence Command** — A/C AC Hull
- CFB Chatham
- CFB St Hubert
- CFB Bagotville
- CFB North Bay
- CFB Comox
- CFB Cold Lake

**Air Transport Command** — A/C GG Diamond
- CFB Goose Bay
- CFB Uplands
- CFB Trenton
- CFB Toronto
- CFB Edmonton

**Maritime Command** — R/Adm JC O'Brien
- CFB Halifax
- CFB Shearwater
- CFB Greenwood
- CFB Summerside
- Maritime Command (Pacific) — R/Adm JA Charles
  - CFB Esquimalt

**Mobile Command** — Lt Gen WAB Anderson
- CFB Gagetown
- CFB Valcartier
- CFB Petawawa
- CFB Rivers
- CFB Calgary
- 4 CIBG — Brig AJ Tedlie
- 1 Air Div — A/V/M RJ Lane

**Materiel Command** — Maj Gen RP Rothschild
- CFB Moncton
- CFB Montreal
- CFB Rockcliffe
- CFB Cobourg
- CFB London

**Training Command** — A/C RC Stovel
- CFB Cornwallis
- CFB St Jean
- CFB Kingston
- CFB Borden
- CFB Clinton
- CFB Centralia
- CFB Winnipeg
- CFB Shilo
- CFB Portage la Prairie
- CFB Moose Jaw
- CFB Gimli
- CFB Penhold
- CFB Chilliwack

# EASY... at first sight

1 Colonel Wrench is always on time and normally walks up the escalator to his office at the rate of one step per second. Twenty steps bring him to the top. One day because of a delay he had to hurry to make it to his office on time. He ran up the escalator at two steps per second, reaching the top in thirty-two steps. How many steps are there in the escalator?

2 Find the smallest integer which is such that if the digit on the extreme left is transferred to the extreme right, the new number is three and a half times the original number.

3 A traveller finds himself without funds in a strange town. His only valuable possession is a gold watch chain of 23 links. To pay the landlady he arranges to give her as collateral one link a day for 23 days. What is the minimum number of links the traveller must cut from the chain if it is only required that the number of links the landlady has corresponds to the number of days.

4 A man is sitting in a large office looking at a wall mirror, X, which is in front of him. Behind him is a typist who is reflected first in another mirror, Y, parallel to X, and that reflection is seen ( by the man ) reflected in X. This secondary reflection does not, of course, reverse the typist from left to right, as the primary reflection in Y does. She is at that moment in actuality moving away from the man, he observes the odd fact that the secondary reflection of her in X is also moving away from him. How are the mirrors arranged?

5 In the following cryptogram each dot represents a digit. Different dots do not necessarily represent the same digit. You are required to find the correct digit for each dot which will yield the situation depicted. Note, the solution to this problem is unique.

```
    ..
   ..   (mult)
   ...
  ...
  ....
  1..   (add)
  .....
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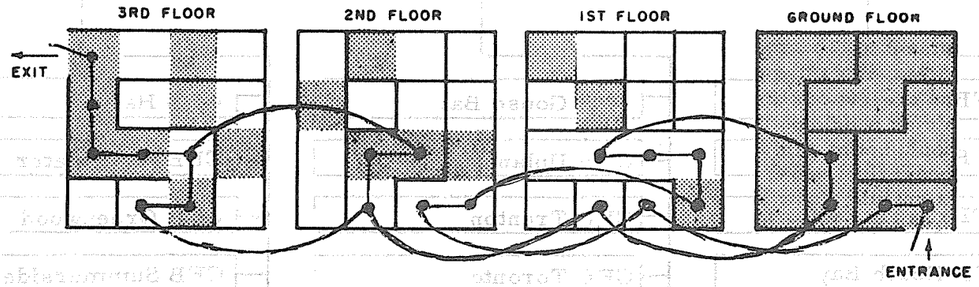
1 The squares in opposite corners of a chessboard are the same color. When these two squares are removed there will be 62 squares left. Thirty-two of these squares will be of one color and the remaining thirty will be of the opposite color. Therefore, since a domino will cover one square of each color, the chessboard cannot be covered with 31 dominoes.

2 In the problem of the block sizes you must make use of the fact that the dimensions of the blocks are whole numbers. The problem states that: $x^3 + y^3 = 12x + 12y$ where x and y are the lengths of the sides of each block.

By examining this equation and using trial and error methods you will find that the only whole number solution is x = 2, y = 4.

3 The two shortest paths are shown in the diagram. Note that the two loops near the top offer two different routes of equal length.

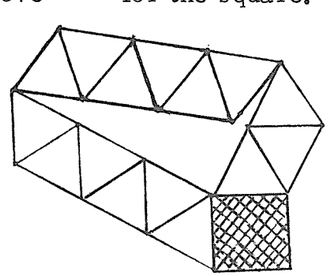



4 The integers 1, 3, 8, & N have the property that the product of any two when added to unity yields a square. Then,

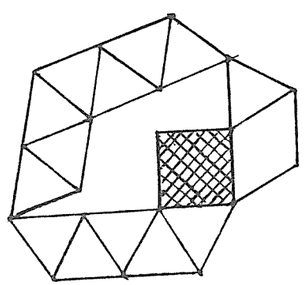
(1) x (N) + 1 = a square
(3) x (N) + 1 = a square
(8) x (N) + 1 = a square

This is another trial and error solution. However, when logic is applied to the above three equations, you can eliminate all squares from 1 upwards until you consider the square 121. This yields the solution N = 120.

5 The best solution to the problem of bracing a square on a plane with the minimum number of rods, all equal in length to the square's side, calls for 31 rods in addition to the 4 used for the square.



Solution 1



Solution 2